REPORT

ON THE PROGRESS OF CIVIL AVIATION IN INDIA

1935-36



GOVERNMENT OF INDIA
DIRECTORATE OF CIVIL AVIATION

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REPORT ON THE PROGRESS OF CIVIL AVIATION IN INDIA, 1935-36.

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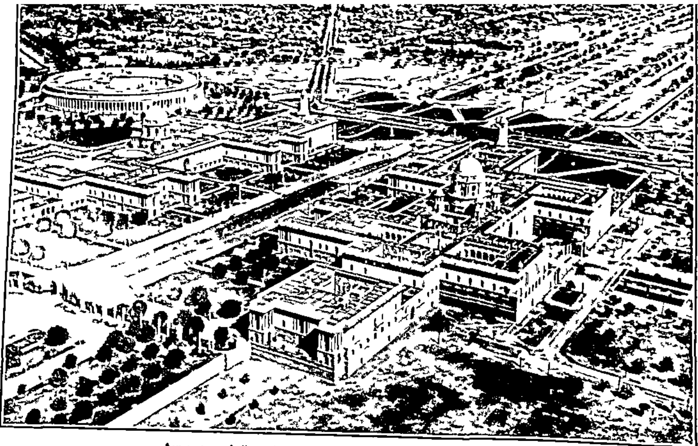
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Air view of Secretariat and Council Chamber, New Delhi.

By courtesy of Indian Air Survey and Transport Ltd

[Frontispiece

[To face Introduction

INTRODUCTION

This Report on the Progress of Civil Aviation in India covers the financial year up to 31st March, 1936, but following the practice of previous years all statistics are given for the calendar year 1935, for ease of comparison with those of other countries

The figures showing the progress of the world's air routes in the few years since regular air transport began illustrate the magnitude and importance of the efforts that have been made, and are being continued with increasing energy, to secure the benefits of rapid air communication and the advantages of being early in the field

Regular air routes were first established in 1919 Ten years later, when the England-India service was inaugurated, the air routes in regular operation throughout the world measured 125,800 and 53,370,000 miles were flown on these routes At the present time more than 225,000 miles of air routes have been established on a regular basis and are being flown in many cases with greatly increased frequency and with much larger and faster types of aircraft The mileage flown annually now exceeds 100,000,000 miles

India's future in the development of civil aviation is intimately connected with the great expansion of air transport which is now unfolding itself within the British Commonwealth of Nations It is important, therefore, to realise that in point of mileage the air routes of the Empire countries as a whole have recently taken the leading place amongst the empires and states of the world The following table indicates the development of air routes by the leading nations during the past three years —

Mileage of Regular Air Routes

	Great Britain	India	British Commonwealth of Nations	United States of America	France	Germany
1933	11 670	5 180	32 670	47 687	21 450	17 228
1934	13 750	5 830	41 390	50 800	21 290	23 440
1935	19 739	6 395	53 291	52,461	24 451	22,291

The traffic figures show that this foresight is not misplaced, and that ever-increasing use is being made of the air highways The growth of British air traffic, in particular, offers a remarkable example of air transport development in a country where a conservative policy has been pursued as regards subsidies and where the conditions are unfavourable for the advantages of flying to be displayed. The following figures show the marked advance that has been made in the past three years by Imperial Airways, Ltd, and other United Kingdom companies :—

British Regular Air Transport Services.

	Miles flown	Passengers carried	Outward Air Mails (external)	Total Air Mails (internal and external)
			Tons	Tons
1933	2 638 000	79,100	85	171
1934	4 557,000	135,160	122	250
1935	7,637,000	143,413	(approx)215	629

Below are given the traffic figures extracted from Appendices 7—11 for India's internal feeder services, and while there has been expansion of air mails on these routes it can be said with truth that the benefits of air transport in India remain yet to be appreciated by the travelling public

Indian Regular Air Services.

	Miles flown	Passengers carried	Air Mails
			Tons
1933 .	153 680	155	10 5
1934 . . .	345,771	757	21 3
1935 . .	553,754	553	43 4

In the Report of 1934-35 mention was made of a scheme for the reorganisation of the Empire air mail services. So far as India is concerned the scheme involves :—

(a) an increase in the number of services on the trans-India route from two to five weekly in each direction ;

(b) a "speeding up" of schedules so that the journey between Croydon and Karachi will be completed in about 2 1/2 days ;

(c) the carriage of all first class Empire mail (letters and postcards) by air.

If these changes are introduced, and it is found possible for India to reap the full benefit of them as a partner in the scheme, the effect upon Civil Aviation in India will be of the first importance The postal and financial details have, however, required prolonged examination, and in the present Report it is impossible to make any further announcement on the subject

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SECTION I.

COMMERCIAL FLYING.

AIR TRANSPORT COMPANIES OPERATING IN INDIA.

No changes have taken place during the year under review in the constitution of the five operating companies engaged in regular air transport in India The companies and the services they operate are as follows —

Company	Services
Indian Trans Continental Airways, Ltd	Karachi—Singapore (operated jointly with Imperial Airways, Ltd).
Tata Sons, Ltd . . .	Karachi Bombay Madras Bombay Cannanore Trivandrum.
Indian National Airways, Ltd	Karachi Lahore
Himalaya Airways, Ltd	Hardwar Gauchar
Irrawaddy Flotilla and Airways, Ltd	Rangoon Mandalay Rangoon Yenangyaung

Imperial Airways, Ltd , the Dutch K L M , and Air France, have continued to operate air services across India

IMPERIAL AIRWAYS, LTD , AND INDIAN TRANS-CONTINENTAL AIRWAYS, LTD.

Aircraft and personnel —Indian Trans Continental Airways, Ltd

Aircraft Type and No	Personnel	Europeans	Indians
A W 15 " Atalanta " 4	Administrative Staff	15	1
	Pilots and Wireless Operators .	11	1
	Ground Engineers	49	27
	Engineer Apprentices		6
	Others		85
	Total	75	120

Air Mail Surcharges.—The flat rate for air mails to India introduced by the British General Post Office in December, 1934 (abolishing the extra surcharge for carriage by the Indian internal air services), and the reduced rates of combined postage

and air surcharge in force in India for letters to England, continued unchanged So far as India is concerned, the present rate of 7½ annas for the first ½ oz and 7 as for each subsequent ½ oz does not compare unfavourably with 6*d* per ½ oz charged by the British Post Office in respect of letters from the United Kingdom to India No further reduction is contemplated until the whole question is reviewed in the light of the proposals for the carriage of all first class mail by air between Empire countries under the Empire Air Mail scheme

Croydon-Karachi Section.—The total weight of mails carried by Imperial Airways, Ltd, to and from India reached 82·2 tons in 1935, an increase of 39% on the figure of 59·2 tons carried in 1934 and 68% on the 1933 figure of 48·8 tons It has been estimated that over 25% of letters from India to Empire countries are now sent by air

Increases in the frequency of the services, reduction of the air mail rates and improvement of the feeder services in India, have each played a part in bringing about this large development of air mail traffic, but even so the figures afford a striking proof, if proof were needed, of the utility of the air mail services and the growth of public interest and confidence in the facilities provided

In this connection it is of interest to record that Imperial Airways, Ltd, estimate that 10,500,000 letters (about 215 tons) were despatched by air from Great Britain during 1935, as compared with about 6,000,000 letters (122 tons) in 1934 and about 4,000,000 (85 tons) in 1933

The growth of Imperial Airways' passenger traffic to and from India has shown an even more striking advance, as the following figures show —

Year	No of Passengers To India	No of Passengers From India
1930	78	70
1931	80	74
1932	150	142
1933	216	211
1934	280	326
1935	455	528

The England-India service was duplicated at the beginning of 1935, and it continued to operate on the following twice-weekly schedule until 16th March, 1936 —

London	Dep	Saturday	Tuesday.
Karachi	Arr	Thursday	Sunday
Karachi	Dep	Wednesday	Sunday.
London	Arr	Monday.	Friday.

In spite of duplication since December 1935 the loads to be carried have frequently been found to be beyond the capacity of one machine and a second machine has had to proceed between Karachi and Sharjah to help with the loads

During 1935 104 services were operated from London to Karachi of which 87 arrived punctually and 17 were late The delays arose through causes to a large extent outside Imperial Airways control On repeated occasions the train connection between Paris and Brindisi was late and this was responsible for a day s delay on 9 services During the period from 5th to 16th March 1935 when there were civil disturbances in Greece the service between Brindisi and Alexandria ran *via* Tobruk Benghasi and Malta and delay was unavoidable

In the opposite direction 104 flights were performed of which 91 left Karachi on scheduled time The delays on the remaining services were all due to the late arrival at Karachi of the Trans India service

The Hannibal class of aircraft which is a familiar sight at Karachi has been operating steadily since 1931 and has a record unrivalled by any other type of commercial aircraft in the world but is now obsolescent Replacement of the Imperial Airways fleet has been delayed by uncertainty as to future policy and it was only last year that the company placed new orders in anticipation of the developments foreshadowed by the Empire Air Mail Scheme The company have been obliged to work to very narrow margins and the continued increases in the loads offering have not tended to reduce their embarrassment In 1935 one of the company s flying boats on the Mediterranean section suffered misfortune catching fire in Brindisi harbour In order to cope with the situation a smaller flying boat of an obsolescent type had to be recalled into service and late in the year this machine suffered disaster through running short of fuel when in sight of Alexandria harbour This was followed by severe storms in the Mediterranean which wrecked the company s seaplane base at Alexandria and put the final touch to the dislocation of the Mediterranean section of their service Owing to the shortage of flying boats on the Mediterranean section the schedules of the services were altered as follows as from 16th March 1936 —

London	Dep	Saturday	Wednesday
Karachi	Arr	Thursday	Monday
Karachi	Dep	Wednesday	Saturday
London	Arr	Monday	Thursday

This schedule results in a delay for the mails between India and Africa but it can only be regarded as temporary pending the delivery of the new flying boats and their being placed into service on the Mediterranean section which is expected to take place this summer

As soon as the new types of aircraft now on order for the Empire Air Mail Scheme begin to be delivered, the temporary superiority in performance of foreign air liners will disappear It is of interest to remark in this connection that four of the prominent air transport operators in the United States of America, a country at present in the forefront of air transport development have recently combined to order a new experimental type of air liner, the specification of which is in most respects very similar to the type of machines now building for the Imperial Airways service

Statistics of air mail and other traffic and regularity of operations on the England India route are given in Appendices 1 2 and 4 pages 64—66 and 68

Karachi Singapore Section —The year 1935 commenced with the duplication of the Trans India service operated jointly by Imperial Airways Ltd and Indian Trans Continental Airways, Ltd from Karachi to Calcutta and the maintenance of the weekly service from Calcutta to Singapore From 1st October 1935, the service then terminating at Calcutta was also extended to Singapore so preparing the way for the duplication of the entire service from England to Australia which was completed in the following May

Mail traffic on the Trans India service increased at an even more satisfactory rate than that on the England India service, the percentage increase for the year reaching 128 5% as compared with 39% on the Croydon Karachi section

43 7 tons of mail were carried in the eastward direction and 42 5 tons in the westward direction giving a total of 86 2 tons for the year as against 37 7 tons in 1934 The following figures show the progressive increase from quarter to quarter —

	Eastward Tons	Westward Tons
March quarter	8 4	8 6
June quarter	10 5	9 8
September quarter	11 1	10 5
December quarter	13 7	13 6

The heavy increase in the last quarter was caused partly by the extra loads at Christmas and partly by the increase in transit mails resulting from the extension of the duplicate Trans India service to Singapore in October Extra services were operated at Christmas as in 1934 A photograph illustrating the arrival of Christmas mails at Dum Dum appears facing page 8

Passenger traffic on the trans India route has also shown a remarkable development The volume of this traffic is expressed in passenger ton miles since individual passengers may fly over only one stage or over the entire distance from Karachi to Singapore The increase is shown by the following figures —

1933	Passenger ton miles	12 311
1934	Do	78 375 4
1935	Do	117 180·2

Aircraft flying on the trans India route in 1935 spent 5 664 hours in the air and flew 580 127 miles—equivalent to 23 times round the world at the equator

208 flights were performed between Karachi and Calcutta and 130 between Calcutta and Singapore These figures are the totals of both eastbound and westbound services 173 services between Karachi and Calcutta were operated to schedule and 106 between Calcutta and Singapore The eastbound service to Calcutta was delayed on 20 occasions owing to the late arrival of the Imperial Airways aircraft from Croydon once through bad weather and once through no aircraft being available In the reverse direction the arrival at Karachi was delayed on 13 services through the following causes —

Delayed departure from Singapore	4
Mechanical trouble	7
Weather	1
Unserviceable aerodrome	1

Details are not received as to the causes of delays between Rangoon and Singapore There were many instances of delays being made good and the schedule regained by the commencement of flights before daybreak or their continuance after nightfall in spite of the lack of adequate night lighting facilities on the route On occasions delays of 24 hours or more were thus made up by intensive flying The trans India route from Karachi through to Calcutta is now being equipped with a complete organisation for night flying while night lighting installations are being provided at Akyab and Rangoon

The schedule was altered from 16th March 1936 to conform with the alterations made throughout the route and is now as follows —

Karachi	Dep	Monday	Thursday
Singapore	Arr	Thursday	Sunday
Singapore	Dep	Sunday	Wednesday
Karachi	Arr	Wednesday	Saturday

Detailed mail and operational statistics of the service are given in Appendices 5 and 6 (page 69 70)

Singapore Australia Section—The weekly extension to Australia, begun late in 1934, continued to operate throughout 1935 A measure of its success is the large increase in transit mails carried by the Trans India service to and from Singapore, where contact is made with Qantas Empire Airways, Ltd , the company responsible for the Singapore Brisbane section The weight of transit mails was nearly trebled in 1935, 46 5 tons being carried compared with 16 1 tons in 1934 The through schedule between India and Australia during 1935 was as follows —

Karachi	Dep	Thursday evening
Brisbane	Arr	Thursday afternoon
Brisbane	Dep	Wednesday morning
Karachi	Arr	Wednesday morning

On May 15th 1936 a date not covered by this report Qantas Empire Airways Ltd , duplicated their service between Singapore and Brisbane, thus completing the final stage of the duplication of the England Australia route and providing a twice weekly service from Croydon through to Brisbane This is the longest through air route in the world and the aircraft engaged on it are now scheduled to fly more than 2½ million miles in a year

FOREIGN AIR SERVICES

K L M and Air France—An important development in connection with these services was the duplication and speeding up of the K L M (Dutch) air line from Amsterdam to Batavia The Douglas aircraft now in service cruise at a speed in the region of 200 miles an hour and have given a striking demonstration of the higher speeds now possible in air transport as the result of recent technical improvements in aircraft and engines

The number of flights across India made by K L M and Air France aircraft during 1935 was as follows —

	Eastbound	Westbound
K L M	81	80
Air France	52	52

Both services are flying at a higher speed, as will be observed from the following comparison between 1934 and 1935 schedules —

	1934	1935
K L M—		
Amsterdam Karachi	4½ days	3½ days
Air France—		
Paris Karachi	6 days	4½ days

The services are operated to different schedules during the Winter and Summer months and the above schedules relate to the services operating at the end of the year

The quick passage afforded by the K L M service has appealed to the public as the following figures for the number of passengers carried between India and Europe will show —

	To India	From India
1934	19	46
1935	161	185

Neither of the two foreign air lines is permitted to carry passengers between places in India and the only mails which may be carried are those destined for countries which are not served by the Imperial route

Statistics of the weight of air mails carried by K L M and Air France are given in Appendix 1 (page 64) Operational and punctuality statistics are combined with those of Imperial Airways Ltd in Appendices 2 and 4 (pages 65 66 and 68) The growth of air mail traffic to and from India by all services is illustrated in Graph II (facing page 18)

INDIAN INTERNAL SERVICES

Tata Sons, Ltd

Aircraft and personnel

Aircraft Type and No		Personnel	Europeans	Indians
Leopard Moths	2	Administrative staff	1	11
Miles Merlin	2	Pilots and Wireless Operators	1	5
Fox Moths	2	Ground Engineers	1	3
		Engineer Apprentices		10
		Others		9
		Total	3	38

Karachi Bombay Madras Air Mail Service—Tata Sons Ltd completed their third year of operation of this service on 15th October 1935 A very remarkable advance has been made in the weight of air mails carried It is estimated that no less than 40% of the mails carried on the England India service are collected or distributed in South India by the Karachi Bombay Madras feeder route

The mail loads during 1935 amounted to 30 2 tons (67 625 lbs) as compared with 18 5 tons (41 487 lbs) in 1934 and 10 5 tons (23 485 lbs) in 1933 This shows the very satisfactory rate of increase of 63% in 1935 following upon an increase of 76% in 1934 Outward mails again exceeded inward mails so that Indian correspondents may congratulate themselves on resuming their lead in utilising the air mail service The lead was temporarily

lost when inward mails increased upon the abolition of the extra charge made in the United Kingdom for carriage by air in India

Passenger and freight traffic also increased substantially and hold out definite promise of future development 40 passengers and 364 lbs of freight were carried, the corresponding figures for the previous year being 14 and 111 lbs respectively

The total mileage flown during the year was 287,610, representing an increase of 100% over 1934, this increase resulting from the doubling of the frequency in January, 1935, in order to maintain connection with the duplicate England India service For the third successive year the route was flown without accident involving injury to passengers or crew

One incident alone occurred to mar the company's good record when the southbound machine on its way to Madras made a landing in a field at Ganjwarpellam in Kurnool District In endeavouring to take off again the pilot failed to see that his path was not clear and fatally injured two villagers

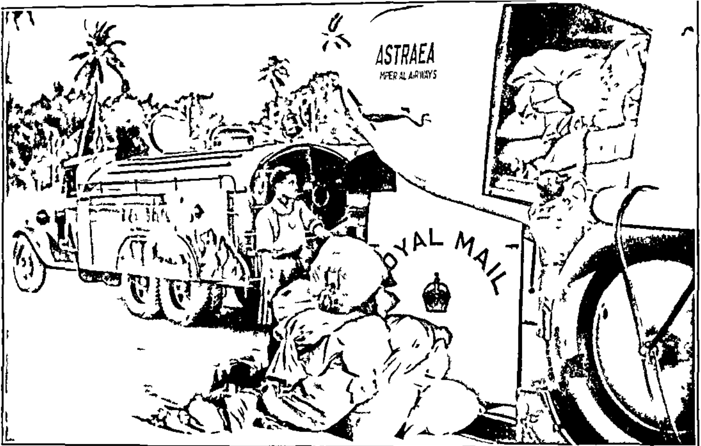
207 flights in all were commenced and 204 were completed, indicating a standard of regularity above 98%

In the southward direction 100 services were completed 10 of which were delayed through the late arrival of the eastbound Imperial Airways' machine at Karachi The only other instance of delay occurred through a forced landing at Viramgam while three southbound flights had to be terminated at Hyderabad and the mails transferred to the train In the northward direction 104 flights were performed of which 100 were operated to schedule. Delay occurred on four services due to bad weather, engine trouble and one forced landing Three times in December the service had to be duplicated in both directions to cope with the extra Christmas mails.

As in 1934, the unserviceability of Juhu aerodrome and difficulty of flying over the Western Ghats during the monsoon made it necessary to run the service *via* Poona during the period 31st May, 1935, to 6th October, 1935, the mails being carried by rail between Poona and Bombay

In August, 1935, the company placed a new type of aircraft in service on the route, the Miles Merlin This is a single-engined low winged monoplane of 200 h p , capable of an operating speed of 125 miles an hour, with a load capacity sufficient to accommodate one or more passengers in addition to mails With machines of this type the company hope to be able to fly from Madras to Karachi in one day, and the Government is granting the company financial assistance for the conduct of experiments in the use of radio-telephony installed in their Miles Merlin

The operating schedule of the service remained unchanged during 1935, but was altered in March, 1936, when revised timings



Christmas Mails being unloaded at Dum Dum

were introduced for one of Imperial Airways' services from England The schedule at the close of the year was as follows —

Karachi	Dep	Friday	Monday
Madras	Arr	Saturday	Tuesday
Madras	Dep	Monday	Friday
Karachi	Arr	Tuesday	Saturday

and this was altered in March as shown below —

Karachi	Dep	Friday	Tuesday
Madras	Arr	Saturday	Wednesday
Madras	Dep	Monday	Thursday
Karachi	Arr	Tuesday	Friday

Operational statistics of the Karachi Madras service are given in Appendix 7 (page 71)

Towards the end of 1935 the Ceylon Government completed the Ratmalana landing ground at Colombo Already many machines have made the flight between Madras and Ceylon and the future should see the extension of Tata s route to Colombo

Bombay-Trivandrum service —In 1934 the Hyderabad State arranged with Tata s for the diversion of the Karachi Madras route *via* Hyderabad and in the Bombay Trivandrum service we again see an Indian State playing a leading part in the development of India s internal airways

In co operation with the Government of H H the Maharajah of Travancore Messrs Tata Sons Ltd established on 29th October 1935 an experimental weekly service between Bombay and Trivandrum *via* Goa and Cannanore for a period of six months The consent of the Portuguese Government was necessary for the call to be made at Goa and the Government of India agreed to the use of a military landing ground at Cannanore Special customs arrangements had to be made in connection with this service

The service connects at Bombay with the Karachi Madras service, in both directions and carries passengers freight and mail As compared with surface transport the service shows a saving of 20 hours on the journey from Bombay to Goa 42½ hours from Bombay to Cannanore and 46 hours from Bombay to Trivandrum

In addition to these direct savings Travancore gains the advantage of the time saving to other destinations effected by the Karachi-Madras service and the much greater saving made possible on communications with Europe by the air connection with the England India service, *via* Bombay and Karachi

The following schedule was in operation at the end of March 1936 —

Bombay	Dep	0600 hrs	Wednesday
Trivandrum	Arr	1520	,
Trivandrum	Dep	0800	Monday
Bombay	Arr	1650	,

On 20th April, 1936, the service was suspended By the end of 1935, 19 flights covering a distance of 14,916 miles had been performed with 100% regularity, 11 passengers and 80 lbs of mail being carried Operational statistics are given in Appendix 9 (page 73)

Provided further support is forthcoming the company hope to resume the service after the monsoon season

Indian National Airways, Ltd.

Aircraft and personnel

Aircraft Type and No		*Personnel*	*Europeans*	*Indians*
Percival Gull	2	Administrative staff	2	10
D H Fox Moth	1	Pilots & Wireless Operators	4	2
D H Dragon Moths	4	Ground Engineers	4	4
Avro X	1	Engineer Apprentices		4
		Others		61
		Total	10	81

1935 was a disappointing year for Indian National Airways Ltd Halfway through the year they were obliged to close their regular services operated from Calcutta and early in 1936 a further reduction of their Calcutta charter organisation was made The company were also obliged to close the Rangoon Flying School which in its 15 months of operation had already proved its worth These reverses were due in the main to the surprising lack of support for the Calcutta Dacca Service, and to the duplication of the through service between Calcutta and Singapore

In December, 1935 the company who had been maintaining and operating the Government s Avro X aeroplane under contract, were entrusted with a further contract for the maintenance and operation of H E The Viceroy s Avro 642 ' The Star of India " in addition to the Avro X Both these machines are maintained at Delhi

The company found that the mail loads on the Karachi Lahore service which they operated under Government contract remained substantially at the same level though their operating costs were much increased by the duplication of the main service in January 1935 The effect of this on the company's operations may be gathered from the fact that in the case of the Tata service mail revenue brings in on an average Re 1 per mile flown, while the Indian National Airways service has received barely 8 annas per mile flown In both cases the mail capacity which the companies must reserve for the Postal Department is the same

Early in 1936 the company found themselves obliged to approach Government for financial assistance if they were to continue operating at all In view of the developments which were to be expected in 1937 on the inception of the Empire Air-Mail Scheme, Government agreed to tide the company over by a special grant for the year 1936 37 As a condition of this grant the company have to continue the operation of the Karachi Lahore service and to maintain the two Government aircraft at Delhi, thus providing a nucleus organisation against the possibility of expansion In fact, the grant does no more than safeguard the company against loss on the Karachi Lahore service during 1936 37 It will be recalled that the company own a substantial share of the capital of Indian Trans Continental Airways Ltd, and act as principal agents to this company and to Imperial Airways, Ltd

Karachi-Lahore Air Mail Service.—The Karachi-Lahore service was inaugurated in December, 1934, and carries about 15% of the total India air mail The frequency of the service was doubled in January, 1935, to conform with that of the main service, this increased the company's expenses without causing a corresponding increase in receipts The service affords a saving of time over surface transport of 24 hours for Baluchistan and 18 hours for Lahore The real benefit of the time saving cannot be reaped until the route is completely equipped and flown by night

During the very heavy rainfall in March the landing ground at Sukkur became unserviceable and the service was interrupted on several occasions In June, the R A F landing ground at Jacobabad took the place of Sukkur and was taken over by the Civil Aviation Directorate The construction of runways on the landing area was taken in hand so that the rains should not in future cause interruption of the service

A small beacon was installed at Sukkur and a mobile floodlight unit originally supplied at Sukkur and transferred later to Jacobabad enabled the company to make their night stop here and fly an appreciable part of the intervening distance from Karachi in darkness The company can thus claim the distinction of being the first Indian company to operate a partial night schedule

In the northward direction 104 flights were scheduled 99 were completed and five cancelled Three services were cancelled owing to the unserviceability of Sukkur landing ground and two were abandoned through the late arrival of Imperial Airways at Karachi, on these latter occasions two consignments of incoming mail were carried by one service from Karachi to Lahore Delay occurred on 14 services, but in all but two cases the delay was attributable to the late arrival of the England India service

In the southward direction 102 services were completed out of 104 scheduled, the two cancellations being due to the difficulties

experienced at Sukkur landing ground Three services were delayed one day through mechanical causes

The total weight of mails carried in 1935 was little short of 11½ tons and the mileage flown during the year was 147,174 Two passengers and 75 lbs of freight were carried

Percival Gull aircraft are employed on the service and the present schedule is as follows —

Karachi	Dep	Thursday	Monday
Lahore	Arr	Friday	Tuesday
Lahore	Dep	Tuesday	Friday
Karachi	Arr	Wednesday	Saturday

Operational statistics of the Karachi Lahore service are given in Appendix 8 (page 72)

Suspended Services.—The Calcutta Dacca Chittagong and Calcutta Rangoon services, which were operated by Indian National Airways Ltd , were discontinued in June and August respectively

The services were operated with very great regularity for 18 months, even through the extremely difficult weather of the monsoon in Bengal and Burma, and the decision to suspend operations after such an excellent demonstration of reliability was particularly disappointing This step was forced on the company by the failure of the public to support the services on the scale expected

Calcutta-Rangoon —From November, 1934, until March, 1935, the service was operated twice weekly in each direction, one of the services connecting in each direction with the duplicate England India service, then terminating at Calcutta By this means, Calcutta and Rangoon were linked by three air services a week, one of which was the through service England Australia A saving of two days in transit time was offered by the air services with a frequency equal to the steamship lines From 15th March until 9th August, the service was reduced to a weekly schedule, connecting at Calcutta with the duplicate England India service

Traffic on the Calcutta Rangoon route showed a gradual improvement, but the duplication of the main service on the Calcutta Singapore section sounded the death knell of the service, although the communities served by the intermediate aerodromes at which Indian National Airways' service had been wont to call felt very much the loss of what to them was an important link with civilisation

Durıng the perıod of operatıon ın 1935 86 servıces were completed ın each dırectıon and 3 067 lbs of maıls were carrıed Operatıonal statıstıcs of the servıce are gıven ın Appendıx 10 (page 74)

Calcutta-Dacca-Chıttagong —Efforts to stımulate traffic on thıs route met wıth an unaccountable lack of response The flight from Calcutta to Dacca saves 15 hours on a 16½ hours surface journey yet the traffic attracted remaıned at a low level A reductıon of fares was offered ın an attempt to popularıse the servıce but ın spıte of these ınducements the traffic revenue fell far below that requıred to maıntaın the servıce As a result the opınıon ıs now held that thıs route cannot be successfully developed on a regular basıs untıl ıt forms part of a through route to Assam

The servıce was operated four tımes weekly between Calcutta and Dacca wıth an extensıon to Chıttagong twıce weekly untıl ıt was dıscontınued on 15th June

127 flıghts were performed ın each dırectıon between Calcutta and Dacca of whıch 54 were extended to and from Chıttagong and 785 lbs of maıls were carrıed Operatıonal statıstıcs are gıven ın Appendıx 11 (page 75)

The Rangoon Flyıng School ıs dealt wıth ın Sectıon II

Hımalaya Aırways, Ltd

Hımalaya Aırways Ltd conducted approxımately 160 flıghts on theır aır servıce between Hardwar Agastmunı and Gauchar, whıch caters for pılgrıms vısıtıng the temple at Badrınath and for tourısts who wısh to see the Hımalayas at close quarters

The servıce was officıally ınaugurated on 19th Aprıl by the Dırector of Cıvıl Avıatıon ın Indıa The 70 mıles journey from Hardwar to Gauchar through the Ganges valley ıs flown ın one hour whereas ıt may take pılgrıms 10 days travellıng on foot Four aırcraft were avaılable and flıghts were made as and when requıred durıng the pılgrım season Flyıng was contınued through the monsoon and 350 passengers were carrıed on the servıce

In June Her Excellency the Countess of Wıllıngdon flew ın one of the Company s aeroplanes over Badrınath and saw the peaks of Nanda Devı and Kamet at close quarters

The company also undertakes joy rıdıng flıghts and numerous temporary landıng grounds have been used ın thıs way

Statıstıcs of flyıng and traffic on the Hardwar Gauchar servıce are ıncluded ın the general figures of non regular aır transport whıch appear on page 17

Irrawaddy Flotilla and Airways, Ltd.

Aircraft and Personnel

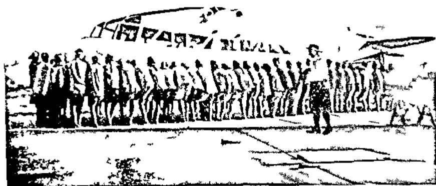
Aircraft Type and No	Personnel	Europeans	Indians
D H Fox Moth Sea plane—1	Administrative staff	1	
	Pilots and Wireless operators	1	
Short Scion Senior Sea plane—1	Ground Engineers	1	
	Engineer apprentices		1
	Others	1	2
	Total	4	3

This company continued the operation of experimental internal air services in Burma The Rangoon Mandalay service was operated throughout the year The Rangoon Moulmein Tavoy service was in operation up to and during March 1935 this service was then suspended and a service from Rangoon to Moulmeingyum substituted instead Flights were made twice a day in both directions on one day in the week namely Tuesday, but were discontinued after the 28th May, 1935

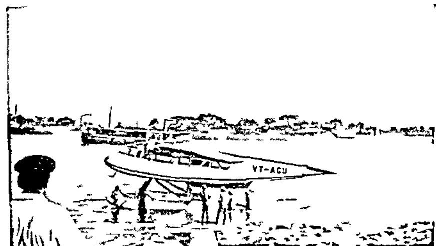
The next enterprise in June was a service from Rangoon to Yenangyaung (Oil Fields) the service being scheduled to operate every Saturday and Monday This service continued in operation throughout the remainder of the year Traffic results were poor but the services were nevertheless operated regularly to schedule except on occasions when flying had to be temporarily suspended for reasons beyond the company s control

In 1936 the company are following the practice of running a service only if passengers offer A Short Scion Senior Seaplane has been purchased for operating on the regular routes while the Fox Moth seaplane already in service is reserved for charter work. The Short Scion is illustrated on the opposite page

The number of miles flown on regular air services during the year 1935 was 71 894 while the passengers and freight carried were 322 and 27 lbs respectively In addition, a number of charter flights was performed during 1935



The fuselage being prepared for assembly on to its floats



At moorings on the Irrawaddy River after launching.

AIR TRANSPORT IN BURMA

The short [illegible] seaplane operated by the Irrawaddy [illegible] and Airways Ltd

[illegible]

[illegible]

MISCELLANEOUS FLYING AND COMMERCIAL ACTIVITIES.

Indian Air Survey and Transport, Ltd.

Aircraft and Personnel.

Aircraft, Type and No		*Personnel*	*Europeans*	*Indians*
Leopard Moth	1	Pilots	1	
		Ground Engineers	1	2
Puss Moth	1	Workshop Staff		19
		Drawing office and Dark room	2	24
		Office and others	1	23
		Total	5	68

Indian Air Survey and Transport, Ltd , were engaged on surveys totalling 3 825 square miles during the year 1935 The area photographed for the purpose of preparing 16" to the mile cadastral maps amounted to 3 200 square miles Photography for town mapping was undertaken at Nagpur and Ajmer and mosaics and maps on a scale of 16" to the mile of these towns were nearing completion at the end of the year

Two exceptionally interesting geological surveys were completed over the Alethengyaw Hills in the Akyab District and in the Dhalbhum District of Orissa, and it was found possible to locate, by stereoscopic examination the position of old copper workings in the latter survey A tour of South India was made in April and photographs for a great variety of purposes were obtained in Madras Mysore and Hyderabad

An irrigation survey was completed over an area of 280 square miles, and the rapidity and economy of air survey methods for this type of work again proved to be of great value Several extended reconnaissance flights were made from Bhagalpur with officials in charge of the districts drained by the Kosi river and a number of areas were photographed for the purpose of recording changes in the river There was a marked increase in the number of oblique photographs taken of factories, estates and buildings of all descriptions for commercial purposes The frontispiece illustration is typical of such work

The company continued to maintain and operate a Fox Moth ambulance aeroplane for the Government of Bengal

A specially modified Leopard Moth and Puss Moth were used by the company, and the photographic equipment consisted of Eagle Mark II cameras with lenses of 8¼", 10" and 21" focal length 163 flights were made by the company s two machines during the year and more than 400 hours were flown representing a distance of approximately 34 000 miles The operations comprised —

	Hours	Minutes
Air Survey photography	261	55
Commercial and Miscellaneous photography	72	45
General flying	68	35
Total	403	15

Bengal Government Ambulance Aeroplane—The Bengal Government purchased in 1933 a De Havilland Fox Moth aeroplane for ambulance purposes The machine has accommodation for a surgeon and nurse, with surgical instruments, and one passenger can accompany a stretcher case In order that the machine may land or take off from either land or water it is fitted with an inter changeable float or wheel under-carriage

Four landing grounds have been prepared and a fifth is under construction (*vide* section III, page 44) These specially prepared grounds, together with the aerodromes under the control of the Government of India and suitable water areas at river stations, enable the machine to be operated over a wide area as and when the necessity arises The machine is based at the Dum Dum Aerodrome

The value of the machine for conveying immediate aid in times of distress was demonstrated after the earthquake of 15th January, 1934, when it was placed at the disposal of the Government of Bihar and Orissa for opening up communication with affected areas About 150 hours are flown each year

Non-Regular Air Transport—The following table shows the amount of non regular air transport, including special charter flying, performed during the year 1935 A large increase is shown, particularly in the operations of Himalaya Airways, Ltd , and Irrawaddy Flotilla and Airways, Ltd , whose services were of a semi regular nature Indian National Airways, Ltd , have considerably increased the volume of their special charter and air

taxi operations, the number of passengers carried having advanced from 257 in 1934 to 795 in 1935.

Non-Regular Air Transport.

Company or Organisation	Journeys	Hours flown	Miles flown	Passengers
Indian National Airways Ltd	461	894	83,960	795
* Tata Sons, Ltd	Not known	375	33,967	1
† Himalaya Airways, Ltd	574	509	36,696	275
‡ Irrawaddy Flotilla & Air ways, Ltd	143	1,026	76,147	349
Flying Clubs	50	428	31,478	63
Total 1935	1,228	3,232	262,248	1,483
Total 1934	272	827	77,501	326

* These flights were primarily demonstration of Autogiro aircraft and test flights, which accounts for the small number of passengers

† Includes demonstration and complimentary flights

‡ Includes flying done on Rangoon Mandalay and other services

Joyriding.—The total joyride flying recorded during 1935 was less than in the previous year owing to the discontinuance of India Air Pageants, Ltd , whose activities accounted for more than half of the joyride flying done Indian National Airways, Ltd , however, more than doubled their joyride flying in 1935 The following table shows the results for the year —

Joyride flying

Company or Organisation	Flights	Hours flown	Passengers
Indian National Airways, Ltd	815	155	2 417
Himalaya Airways, Ltd	2,556	352	6,991
Irrawaddy Flotilla & Airways, Ltd	89	20	239
Flying Clubs	Not known	269	3,400
Total 1935	3 460	796	13,047
Total 1934		1,257	28,550

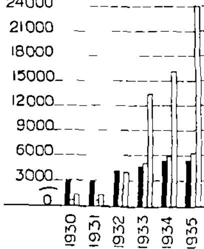
Imports of Aircraft and Aircraft Material.—The import trade in aircraft and aircraft spare parts and accessories has continued on the same scale as in 1933, when the imports included the fleet of Indian Trans-Continental Airways, Ltd. Figures for the three years 1933—35 are as follows :—

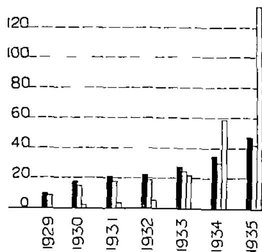
Value of Imports—	Rs.
1933	8,18,174
1934	8,08,565
1935	8,16,604

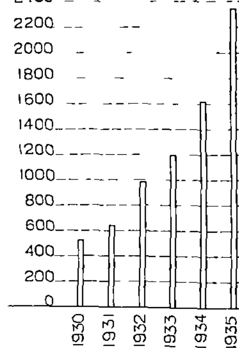
A list of the aircraft added to the Indian Register of Aircraft in 1935 is given in Section IV, Administration (page 57).

De Havilland Aircraft Coy., Ltd.—The distribution and repair organisation maintained by this company at Karachi reports a total turnover of Rs 2,41,619 during the year as compared with Rs 2,58,143 in 1934 Apart from the sale of aircraft and aircraft spares, the company undertakes major repairs to aircraft, complete overhaul of engines and annual overhauls for Certificates of Airworthiness Demonstration and other flights by the company's machines totalled 85 hours, 15 mins , during the year.

GROWTH OF AVIATION IN INDIA







SECTION II

FLYING CLUBS, TRAINING AND PRIVATE FLYING.

FLYING CLUBS

General activity —The following clubs are now at work —

BRITISH INDIA

1 Delhi Flying Club Delhi
2 Karachi Aero Club Karachi
3 Bombay Flying Club Juhu Bombay
4 Madras Flying Club Madras
5 Bengal Flying Club Dum Dum Calcutta
6 United Provinces Flying Club Lucknow and Cawnpore
7 Northern India Flying Club Lahore

INDIAN STATES

8 Jodhpur Flying Club Jodhpur
9 Hyderabad Flying Club Hyderabad

The new club at Hyderabad was formed with the generous aid of H E H the Nizam of Hyderabad It commenced flying in February 1936 when its aircraft arrived from England

The Trichinopoly branch of the Madras Flying Club has been discontinued through lack of support The activities of the Burma Flying Club which was not subsidized were brought to a close when Indian National Airways found themselves obliged to close down the Rangoon Flying School to which the club was affiliated

The progress made by the Flying Club movement in the past six years will be seen from the following table —

Year	Membership	Number of aircraft	Pilots trained ab initio	Hours flown
1930	1 596	19	93	7 54[illegible]
1931	1 880	20	113	9 0[illegible]
1932	1 538	[illegible]6	85	9 717
1933	1 [illegible]0	[illegible]9	68	10 995
1934	1 [illegible]84	33	88	11 [illegible]80
1935	1 690	3[illegible]	[illegible]	10 860

NOTE —The above table includes the Rangoon Flying School for 1934 and 1935

A summary of the activities of the Flying clubs during the year is given in Appendix 12 (page 76)

System of subsidy.—A revised system of subsidy came into force with the opening of the financial year 1936 37 Hitherto, the subsidized clubs have been granted financial assistance for periods of one year only and in consequence have been unable to plan for the future This has placed the clubs in a difficult position, particularly with regard to the engagement of European pilot instructors and technical staff whose services on short term contracts could not readily be obtained

In order to stabilize the position of the clubs and to help them to arrange their affairs further ahead and so improve their organization, it has been decided to maintain the revised subsidy to the same seven clubs for a period of three years (1936 37 to 1938 39), subject to such changes as experience may show to be necessary The clubs have been informed that at the end of this period the subsidy from Central Funds may be curtailed, if not entirely withdrawn, and they have been urged to place their affairs on an economic basis during this period The task before them is not without difficulty, since the work of club management is entirely honorary and those public spirited members on whom the burden falls are generally busy men with little spare time The services of an Accounts Officer were made available by the Directorate for four months of the year for the purpose of inspecting the accounts of the flying clubs and making recommendations in order to assist them on this side of the work

As in 1935 36, the subsidy is divided into two parts, a fixed payment and a bonus in respect of pilots trained The fixed payment is, however, less than in 1935 36 and, in the main, is proportional to the number of serviceable aircraft owned by each club, whereas the bonus paid for each pilot trained *ab initio* has been increased The following comparative statement shows the changes that have been made —

	1935 36	1936 37 to 1938 39
	Rs	
Fixed annual grant .	16 000	For 1 aircraft Rs 8 000 For 2 aircraft, Rs 10 000 For 3 aircraft, Rs 12,000
For each pilot trained *ab initio* and licensed	200	Rs 300
For each "A" licence renewed on club aircraft	100	Rs 100
Maximum subsidy payable to each club	20 000	Rs 20 000

In recognition of the good work which has been done by the Jodhpur Club, it has been decided to give financial assistance during 1936 37 in the form of a bonus paid for pilots trained at the revised rates mentioned above A similar grant would have been made to the Burma Flying Club had not the closure of the Rangoon Flying School intervened

The budget grant for subsidies in 1935 36 was Rs 1,58,000 and the net final appropriation Rs 1,33,000 The budget grant for subsidies in 1936 37 is Rs 1,50,000

Two clubs, the Karachi Aero Club and the Bengal Flying Club succeeded in earning the full subsidy of Rs 20 000 for 1935 36, and as a special concession the Karachi Aero Club received an additional grant of Rs 1 000 in respect of pilots trained over and above the subsidy limit

It is as well to remember that the clubs contribute to Government Revenues in the form of indirect taxation on petrol, oil and material and fees for licences and certificates In the year 1935 36 the total contributed was approximately Rs 56 000, one club alone contributing nearly Rs 11 000 Economically, for the results achieved the flying clubs in India compare very favourably indeed with similar institutions in other countries

The cost of flying per hour varies considerably between one club and another and since standing charges remain substantially the same, those clubs which do the most flying have the advantage It may also be mentioned that the inland clubs are handicapped as freight charges for aircraft spare parts add materially to their costs

The subsidy enables the clubs to reduce their flying rates by an average of Rs 10 per hour In this connection it is noteworthy that the Rangoon Flying School which operating without subsidy, was obliged to charge a flying rate of over Rs 40 per hour, was able to produce such good results

TRAINING RESULTS.

The training results are summarised in the table given below —

Club	Pilots trained			Ground Engineers trained.
	A	A1	B	
Bengal	11		1	
Bombay	17			2
Delhi	8			3
Karachi	16		3	2
Madras	5	1		3
Northern India	6	1		
U P	8	3		
Rangoon Flying School	6	1		1
Jodhpur				
Total 1935	77	6	4	11

Pilot's training.—The number of pilots trained *ab initio* for "A" licences was 77 as compared with 88 in 1934 This reduction is explained by the discontinuance of the Rangoon Flying School and the greater attention given to training commercial pilots The number of Indians included in the 1935 figure was 58, a substantial increase on the previous year

The 'A1" category of commercial pilot's licence is a purely Indian institution with no international counterpart It provides a useful half way stage as it enables pupils holding this licence to fly professionally within prescribed limits so reducing the cost of their further training In one instance an Indian "A1' licensed pilot accumulated nearly 40 hours flying at no expense to himself at the same time helping his club with joy riding It is proposed shortly to increase the scope of the pilot s "A1' licence in order that a pilot may more easily acquire the further 100 hours flying experience which is required for the 'B" licence The standard of technical knowledge of aircraft and engines required for the 'A1' licence has therefore been raised so as to bring it more in line with that required for the B licence

Over and above the knowledge required for the 'A1" pilot's licence the B licence demands in addition night flying experience and a knowledge of meteorology and navigation Arrangements have been made with the Meteorological Department for the training and examination of candidates and pilot instructors of clubs may also receive instruction in meteorology

The international standard demanded to qualify for the pilot's "B" licence has recently been advanced by the addition of a requirement that a pilot shall be able to fly without exterior view by the aid of instruments alone This requirement has not yet been introduced in India as it was necessary first to ensure that the requisite training facilities were available Certain of the clubs are now in a position to give this training and the new requirement will be introduced in 1936

Some of the clubs are at present situated at aerodromes which are not yet equipped for night flying and not every club is able to afford the facilities which are now necessary for the complete course of training for the pilot s 'B' licence, since the number of such candidates offering is insufficient to warrant the employment of additional instructional staff or the purchase of the necessary equipment

In such an important matter as the licensing of pilots no lowering of standards can be allowed and as a result of inspection of the flying clubs during 1935 their training facilities have been approved on the following scales —

Training facilities at flying clubs.

Flying Clubs	Approved for training pilots for licences :—			Approved for instruction in instrument flying	Approved for training G E. apprentices
	"A"	"A1"	"B"		
1 Bengal	Yes	No	No	No	Yes
2. Bombay	Yes	Yes	No	Yes	Yes
3 Delhi	Yes	No	No	No	No *
4 Karachi	Yes	Yes	Yes	Yes	Yes
5 Madras	Yes	Yes	No	No	Yes
6. Northern India (Lahore).	Yes	No	No	No	Yes
7 U P	Yes	Yes	No	No	Yes
8 Jodhpur	(Not subsidised, no Official category)			Yes	(Not subsidised no official category).
9. Hyderabad (Dn)				Yes	

* The Delhi Flying Club works in conjunction with the Aeronautical Training Centre of India, Ltd

Six Indian "B" licence pilots are at present employed in regular air transport companies in India and their excellent safety record is a testimony to the standard of training given by the flying clubs

Pilot-Instructors.—The expansion of aviation in Great Britian has had its effect in that it is now more difficult to obtain qualified instructors for India and higher salaries are demanded The flying clubs at Bombay, Delhi, Bengal and Lahore are employing Indian pilo instructors but their special trainingas flying instructors was originally obtained in England There is an opening at the present time for Indian pilot instructors, but in this vital matter no considerations of expediency can be allowed During the year 1935 no Indian pilots obtained pilot instructors' licences, but towards the end of the year a modification was introduced so as to permit the employment of assistant instructors at the flying clubs under the supervision of a qualified instructor In this way it is hoped to facilitate the training of pilot instructors in India and at the same time to ensure that only those really suitable for such a responsible position receive the licence Two Indian pilots are now receiving training at the flying clubs in this way

Ground Engineers.—The flying clubs are able to take on a limited number of apprentices for training as ground engineers up to the standard required for the "A" and "C" licences for the daily and routine inspection of aircraft and engines The engineering staff of the flying clubs are fully occupied with the

work of aircraft maintenance and cannot therefore always spare the time to give the basic engineering training in the use of tools which is first necessary Apprentices who have not had such experience before joining flying clubs will therefore find them selves severely handicapped When the successful apprentice first obtains his ground engineer s licence, he must work for a period under supervision which is gradually relaxed until he may regard himself as fully fledged and able to work on his own Only one Indian ground engineer is at present in sole charge of aircraft maintenance at a flying club a responsible position which demands the greatest integrity This ground engineer was formerly em ployed in Indian Trans Continental Airways' workshops at Karachi

Wireless operators and air navigators—In 1935, after attachment to an aeronautical radio station and a course of instruction at Calcutta under arrangements made with the Posts and Telegraphs Department one Indian "B" licence pilot obtained a wireless operator s licence He is the first Indian pilot to do so and is now employed by Tata Sons Ltd In view of the demand for aircraft wireless operators which is likely to arise with the increased services now anticipated the Government granted assistance to specially nominated candidates to enable them to qualify Two of these nominees should shortly complete a course at Calcutta and after a period of attachment to an aeronautical radio station should be able to obtain their licences It is proposed to give further assistance for wireless training to nominated scholars during the year 1936 37

One Indian B licence pilot sat at Karachi for the Second Class Air Navigator s examinat on and is now employed at the Karachi Flying Club as an instructor This examination is set and corrected by the Air Ministry and is recognised for the grant of the Indian Second Class Air Navigator s Licence

Aeronautical Training Centre of India—The Aeronautical Training Centre of India at Delhi Aerodrome was opened on the 21st October 1935 A propitious start was made with 50 cadets who were honoured by being inspected by Their Excellencies the Viceroy and the Countess of Willingdon

The Centre is organized to give comprehensive courses in all branches of aircraft ground engineering including mechanical drawing and instruction in wireless telegraphy The workshops are fitted with up to date machinery and equipment and the cadets knowledge and practical ability on completing their tuition should certainly be most useful to employers of skilled engineering staff whether aircraft operators or mechanical engineers since the courses embrace tuition not only in aircraft work but in general mechanics

Arrangements have been entered into with the Delhi Flying Club for flying instruction up to 'A' licence standard to be given by the club to those cadets who wish to include a pilot's licence amongst their qualifications and the Centre proposes to undertake their further flying training so that they may obtain their commercial licences

As a condition of the lease of the ground at Delhi aerodrome the Director of Civil Aviation may exercise the right to nominate up to 50 per cent of the cadets accepted for training These nominations are reserved principally for entrants recommended by the subsidized flying clubs in India which may be regarded as the initial testing ground for those who wish to take up aviation as a career

No establishment has existed hitherto in India for more advanced training in aeronautical engineering The Centre should therefore fulfil a real need although in the higher branches of the science of aeronautical engineering it will probably always be necessary for the most up to date methods of aircraft design and manufacture to be studied in Europe

Civil Aviation Scholarships—The four Indian ground engineers who were receiving training in England in aeronautical engineering returned to India in February 1936 after the completion of their training Two of them have specialized in aircraft and two in aero-engines It is gratifying to note that all four received offers of employment shortly after their return

The scholarship of Mr Nazir who is conducting experiments in England with aircraft anti stalling devices has been extended up to June 1937 and he is being assisted to take out a patent

The two scholars undergoing training in aerodrome control duties at Karachi are expected to complete their training by the end of June 1936 and will probably be appointed as probationary Aerodrome Officers After a period of preliminary training in India the two scholars selected for training in aeronautical engineering have been sent to England for a two years course at the College of Aeronautical Engineering Chelsea On satisfactory completion of their training it is hoped to appoint them as Assistant Aircraft Inspectors (Grade II) on probation

The assistance which Government is giving towards the training of wireless operators has been mentioned earlier

Scholarships granted by local Governments, Indian States and Private bodies—Mention was made in the report for 1933 34 of the financial assistance given to the U P Flying Club by the local Government The assistance has actually taken the form of an annual grant to the club of Rs 4 000 for a period of three years in return for which the club are training an agreed number of nominees of the Government as 'B' pilots on special terms The scholars selected for training must be domiciled in the United Provinces

The Dorabji Tata Trust and the Ratan Tata Trust which between them have helped a certain number of people to make their careers in aviation continued their assistance during the year The former has enabled one Indian to become a pilot instructor of a flying club in India The Ratan Tata Trust has, up to the present, aided or is still aiding ten beneficiaries of whom one is already employed as a ground engineer and another has secured admission to the Royal Air Force while a third is under training with Imperial Airways, Limited Two beneficiaries have received assistance from both the Trusts and one of these will eventually be absorbed in the Aviation Department of Tata Sons, Limited while the other is training for a B" licence

In addition to the above, certain Indian States and private bodies have assisted the cause of civil aviation by the grant of special scholarships

PRIVATE FLYING

Aero Club of India and Burma—The Aero Club of India and Burma now operates as an independent body on a voluntary basis and receives no subsidy from the Government

The Aero Club is the controlling authority for sporting flying and the official representative in India of the Federation Aeronautique Internationale The club is authorised to promote air races displays and competitions requiring international recognition and those who wish to organise contests or present challenge cups or prizes for competition should seek its advice and help Advice is given on all aspects of sporting flying

Aviators who wish to take out Customs Carnets for air touring outside India may do so through the club, and the club also undertakes to obtain permission for flights over foreign countries and provides maps on hire which saves the air tourist a considerable outlay on purchase This latter service is conducted in conjunction with the Automobile Association of Great Britain In addition, the club maintains a liaison with the Royal Aero Club, London, whereby members on leave in England enjoy certain privileges Six Customs Carnets were issued by the club in 1935

Viceroy's Trophy Air Race—The air race for the Viceroy's Challenge Trophy was flown on 14th and 15th February, 1936, over the course Madras Hyderabad Bombay Ahmedabad-Jodhpur Delhi, a distance of 1,520 miles, which was divided into two stages flown on the respective days, with a night stop at Bombay

For the first time in the history of the contest the race was won by an Indian, Lieut Misri Chand, and his success was enhanced by the fact that he is an Indian club trained pilot whose experience of flying has been gained entirely in India



Winner of the Viceroy's Trophy Air Race —Lt Misri Chand

The organisation of the race was again undertaken by the Aero Club of India and Burma It will be remembered that the club made an attempt to hold the race in December 1934, but was obliged to abandon the plans because insufficient entries were received

On this occasion, the race attracted a very satisfactory list of entries, including two from England Mr A C Gardener on a Short Scion and Mr Vaughan Fowler on a B A Eagle, whose speeds in the race were 121 and 137 miles per hour respectively

H. H the Maharaja of Patiala entered his Percival Gull which won the prize for the fastest time in the race and H H the Maharaja of Indore entered a Gipsy Moth from the U P Flying Club. There were ten starters and nine competitors completed the course. The race was run as a handicap based on the manufacturer's top speed figure of the competing aircraft, ranging from 100 to 172 miles an hour

The prizes were awarded by Their Excellencies the Viceroy and the Countess of Willingdon to the following —

1. Lieut Misri Chand —The Viceroy's Trophy with Rs 7,000, and the Speedoline Challenge Cup and Rs 2,000 for being the first India trained 'A' licensed pilot to cross the finishing line Speed 113·8 miles per hour

   D H Moth, Gipsy II engine, entered by Pandit Mulchand Sharma and Capt A T Eadon. (*See* illustration facing page 26)

2 Mr G V Gadgil —The Hari Kishan Das Challenge Shield and Rs. 3,000 for securing second place Speed 111·9 miles per hour

   D H Moth, Gipsy I engine, entered by Mr G V Gadgil (Karachi Flying Club)

3 Mr A C Gazdar —Rs 1,000 for securing third place Speed 118·4 miles per hour

   D H Moth, Gipsy Major engine entered by Mr Stackard (Bombay Flying Club)

4 Capt A F Muir —The Wakefield Challenge Trophy and Rs 200 for the fastest time in the race Speed 156 miles per hour

   Percival Gull, Gipsy VI engine, entered by H H the Maharaja of Patiala

The second fastest machine in the race was the Miles Hawk Major flown by Mr N Vintcent, the Manager of Tata s Aviation Department, with a speed of 143·5 miles per hour

The prize money for the Viceroy's Trophy Challenge race is derived from the interest accruing from investments of the Irwin Trust Fund, which was started in 1931 by Sir Victor Sassoon Two new trophies will be available for future competition, one the Willingdon Trophy to be awarded for the best flying feat of the year performed by an Indian pilot, the other presented by Sir Victor Sassoon, with an annual cash award, for competition between the flying clubs in India

Aircraft in Private Ownership.—The number of registered privately owned aircraft on the 31st December, 1935, was 43, as against 42 on the same date the previous year Of these, 14 were owned by Ruling Princes and Rajahs and 16 by other Indian gentlemen All except six of these private aircraft are of British design and manufacture

H H the Maharaja of Jodhpur owns a large fleet of which his green Percival Gull is probably the favourite Besides the aerodrome at Jodhpur with its first class equipment, many landing grounds have been made in the State and the Maharaja is undoubtedly the first Prince who has himself flown over his capital by night H H the Maharaja of Patiala also owns a fleet, of which the Spartan Cruiser now fitted with wireless is the largest privately owned aircraft in India H H the Maharaja of Jaipur, with his A rspeed Courier joined the ranks of private aircraft owners during 1935 The new aerodrome of Sanganer (Jaipur) was officially opened towards the end of the year and landing grounds are being made elsewhere in the State

H H the Maharaja of Kashmir is the owner of a Dragon Rapide, the Raja of Vizianagram has an Avro Commodore, and a D H Moth which he flies himself The Maharaja of Idar has acquired a Monospar, Prince Ghanshyamsingh of Limbdi flies an Autogiro and H H the Nawab of Junagadh possesses a D H. Moth

There are many examples of private owners transacting much of their business by air One owner of a light aeroplane lives in a province most of which is served only by a metre gauge railway and the roads of which give car passengers more uncomfortable travelling than may be experienced on the roughest of days in the air He has not been in a train, except for proceeding on home leave, for nearly three years His petrol consumption by air is about 18 to 20 miles per gallon

Another, 65 years of age, uses his aeroplane for the inspection of sugarcane and other crops throughout his estates, and he finds that he can obtain by air a very fair idea both as to the condition and quantity of the various crops

One Forest Service official used his private aeroplane for a complete duty tour round the whole of India saving literally weeks of travel by train In each case the fuel cost for the aeroplane compared favourably with that for a medium powered motor car

International Flights—India is on the main air highway from Europe to the Far East and offers to aviators following this highway a chain of first class aerodromes and landing grounds which are rapidly being equipped with the most up to date facilities Aviators in all countries are becoming aware of this and 57 international flights across India or to or from India were made by pilots of many nationalities during the year 1935 There were 51 such flights in 1934 but this number included 13 competitors in the MacRobertson Air Race from England to Australia

Flights emanating from India numbered 11 The Bombay Flying Club undertook once again the instructional flight to London and return This was completed successfully and the fact that the flight has become an annual event should not be allowed to detract from the merit of their effort

Mr Dastur undertook a flight from India to Africa with two companions whom he was obliged to leave at Nairobi They went on to reach Cape Town after an adventurous journey and there joined forces with Mr Man Mohan Singh with whom they finally returned early in 1936 While in South Africa they gave many free flights and thus introduced a large number of persons to their first taste of the air

On one of the international flights between England and Australia, there occurred the tragedy of Sir Charles Kingsford Smith and his co pilot Mr Pethybridge who it is presumed perished in the waters of the Bay of Bengal on 8th November 1935 The year saw also Mr H L Brookes successful attempt on the Australia England record and Miss Jean Batten s plucky effort to improve on his time The solo record established by Brookes was 7 days 19 hours 50 minutes from Darwin to Lympne

A Frenchman making a touring flight between France and Indo China flew non stop between Saigon and Calcutta on both the outward and return journeys

The Bata Shoe Company now send out a small aeroplane from Czecho Slovakia each year on a business trip

His Excellency the Viceroy's Tours—The Star of India (Avro 642) was used on nine occasions for tours by Their Excellencies the Viceroy and the Countess of Willingdon and on

two other occasions for tours by Her Excellency the Countess of Willingdon The following is a list of these tours —

Date	Tour
1935—	
27th February	Delhi Jubbulpore Delhi
6th March *	Lahore Delhi
11th March	Delhi Meerut Delhi
22nd March	Delhi Agra Delhi
14th April	Delhi Lahore
15th April	Lahore Peshawar
17th April	Peshawar Charsadda Kot Abazai Ali Masjid Kajuri Plain Peshawar
20th April	Peshawar Sialkot Ambala
8th July	Multan Ambala
5th September *	Ambala Delhi Ambala
12th December	Calcutta Chittagong Calcutta

In addition to these flights in the "Star of India" Her Excellency the Countess of Willingdon also made use of civil charter aircraft for the following flights under arrangements made by the Director of Civil Aviation —

17th June	Ambala Gauchar, in a machine provided by Himalaya Airways Ltd
20th November	Delhi Kulu (Bhuin) in a machine provided by Indian National Airways, Ltd

The operation and maintenance of the "Star of India" which had hitherto been the responsibility of the Royal Air Force, was transferred to Indian National Airways, Ltd, with effect from 14th December, 1935 This company is now entrusted with the contract for the operation and maintenance of the two Government aeroplanes, the "Star of India" and the Avro X, the latter is available for general Government use and may also be used by the company on payment to Government of a fixed rate per hour. A notable charter effected for Government, was carried out in January 1936, when Sir Eric Teichmann was flown from Gilgit to Delhi The landing ground at Gilgit is some 5000 ft above sea level and had it not been possible to undertake the journey by air Sir Eric would have probably been obliged to wait until the snow melted and the mountain passes were again open A photograph of the Avro X at Gilgit is published facing page 44

* Tours by Her Excellency the Countess of Willingdon

SECTION III.

GROUND ORGANISATION.

REVISED CAPITAL WORKS PROGRAMME.

The capital works programme described in the 1934-35 Report has been completely revised and recast and the opportunity has been taken of making a detailed re adjustment of estimates based upon closer investigation of individual works Very considerable changes have been made in the scope and urgency of the plans

It will be recalled that under the original programme an expenditure of Rs 92,57,000 (£694,275) was sanctioned for the general development of air routes in India over a series of years. The programme was not intended to meet any specified emergency, but a distinction was made between works of first urgency and works of secondary urgency The programme envisaged the complete or partial organisation of five routes, namely —

Karachi-Delhi-Calcutta Rangoon Victoria Point

Karachi-Ahmedabad Bombay-Madras-Colombo

Bombay Calcutta

Karachi-Lahore

Madras Calcutta, Coast route

When the Empire Air Mail Scheme was communicated to the Government of India some months after this programme was approved, it was immediately realised that the plans would require extensive revision, for whatever the decision of the Government of India might be regarding the air mail scheme, it was certain that by 1937 38 air mail services would be much more frequent and would be operating regularly by night as well as by day

Therefore, in place of the extensive development of five air routes, it now became necessary to consider the intensive development of the existing trans India route and its two feeder routes, Karachi Bombay Madras Colombo and Karachi Lahore There were no longer two degrees of urgency since all the work proposed for these routes must be done at once if they were to be made safe for the air mail frequencies and night flying operations of 1937 38

In drawing up the revised programme, all works which could be abandoned or indefinitely postponed, amounting to a total of Rs 23,49,750 (£176 230) were eliminated, and a supplementary programme was compiled including such additional works as were now essential for safe operation both by day and night on these three routes There were also items which were not foreseen when the original programme was prepared such as the equipment of Karachi as a Sanitary Airport, and the development of civil

aerodromes to replace military landing grounds which could not be made permanently available

The new programme in its two parts called for the following expenditure on capital works —

Proposed expenditure Revised Programme

	Rs
Revised original programme	80 26 775
Supplementary programme	29 85 850
	1 10 12 625
	(£825 940)

NOTE —An additional Rs 20 000 is estimated to be the cost of equipping the Sanitary buildings at Karachi

When considering this large expenditure it must be borne in mind that during the six years from 1927 28 to 1933 34 in which civil aviation was a departmental activity of the Government the total expenditure of a capital nature on ground organisation was Rs 69 00 000 (£517 500) Only rudimentary facilities were provided The trans India route was organised on a very modest scale for day flying and practically nothing was done towards the organization of feeder routes

Pending a decision on India s participation in the Empire Air Mail Scheme the Government of India have sanctioned against the revised programme such works as are immediately necessary for the safe operation of the trans India and the two feeder routes The cost of the works now authorised is Rs 92 10 400 (£690 780) as compared with the original sanction of Rs 92 57 000 (£694 275) The details are as follows —

Works sanctioned Revised Programme

	Rs
(1) Improvement of aerodromes	35 11 800
(2) Hangars	16 00 000
(3) New aerodromes and landing grounds	14 66 800
(4) Lighting for night flying	10 56 000
(5) Surveys furniture equipment staff	3 12 000
(6) Meteorology	3 84 800
(7) Wireless	7 [illegible]4 000
(8) Karachi Sanitary Airport (expenditure in 1936 37)	1 05 000
	92 10 400

A tabular statement of the works in progress or completed and the deferred items is given on pages 37 41 and the complete organisation is illustrated in the map of capital works in the folder in the back cover of the Report

This scheme of ground organisation when fully completed will provide a standard of efficiency on the three principal air routes sufficient to ensure that air mail services can be operated with safety and reliability by day and by night and will thus bring India into line with other countries similarly equipped It must

not be supposed however that the capital works programme is final for progress in civil aviation is rapid and continuous and world operating practice is ceaselessly developing and improving

NOTES ON REVISED PROGRAMME

The following comments are necessary to supplement the information given in the tabular statement and to explain particular aspects of the revised programme —

Expenditure, 1935-36 —The approximate total expenditure in 1935 36 on Civil Aviation works excluding wireless and meteorological works was Rs 13 40 000 (£100 500)

Civil Aviation Circle —A special Civil Aviation Circle of the Central Public Works Department comprising five divisions was formed in the spring and early summer of 1935 to carry out the whole of the programme excluding the work ordinarily done by the Wireless Branch of the Posts and Telegraphs Department

Hangars —Nine new hangars are being provided six at main aerodromes on the trans India route and one each at Bombay Lahore and Madras The five hangars previously available were frequently full to capacity and were quite inadequate to satisfy the greatly increased demand for accommodation now in prospect At Karachi where the demand is already heavy and will continue to increase a hangar of 380 feet span (with one central pillar) is being erected

Improvement of aerodromes —A large amount of work is in progress on aerodromes and landing grounds in order to fit them for regular use under the worst conditions of weather At many aerodromes hard runways must be provided so that the aerodrome may be maintained in service during periods of heavy rainfall At present at some aerodromes the absence of runways causes not only delays but serious risk to aircraft and personnel Certain aerodromes and landing grounds must be enlarged to render them suitable for regular night flying and works of drainage levelling and general improvement are necessary at the majority of grounds

The Juhu aerodrome at Bombay presented a particular problem as it is essential to ensure that the ground may be adequately drained during the monsoon While the site of this aerodrome cannot be regarded as ideal the only possible alternative would be on reclaimed land in the Back Bay area Such a scheme would be exceedingly expensive and quite beyond the funds available at present Largely for similar reasons the development of an aerodrome to serve Calcutta at Alipore instead of Dum Dum had to be rejected At Rangoon on the other hand the existing aerodrome at Mingaladon was found to be incapable of improvement except at considerable expense and a new site at Okkan nearer to the city has been selected and will be developed Delay in

aerodrome development work has occurred at Madras where it was necessary to undertake a careful investigation for alternative aerodrome sites

New aerodromes and landing grounds —On fully organized air routes main aerodromes are provided at intervals of from 300 to 400 miles and intermediate landing grounds at intervals of 100 miles or less according to the nature of the country With the new aerodromes and landing grounds now being constructed a reasonably safe provision will be afforded on the routes being organized but the standard falls below the ideal and a closer spacing of landing grounds may be necessary as a later development New aerodromes and landing grounds are marked with an asterisk on the tabular statement on pages 37-41

Lighting for night flying —Air services cannot be operated regularly at night without a night flying organization extending to all aerodromes and certain intermediate landing grounds Hitherto the primitive nature of the lighting arrangements at aerodromes has been only sufficient to deal with emergency late arrivals and early departures The aerodromes on the trans India route are now being provided with electric illumination for night landings in accordance with the most modern standards In addition, airway beacons the equivalent of light houses for the mariner, are being established at intermediate points between the aerodromes and also serve in many cases to mark emergency landing grounds

Aerodrome Control.—Equipment for maintaining the surface of aerodromes in good condition apparatus for dealing with fire or accident to an aircraft on the aerodrome and signalling apparatus for controlling the movements of aircraft are being provided in the programme As in all other matters however it is the human element in control on which the efficiency of the ground organization most depends At the beginning of the year the staff at the Government aerodromes was barely sufficient to deal with the existing conditions and long hours of work were required of them Assistant Aerodrome Officers clerks floodlight operators and drivers were necessary to meet the expansion and recruitment was commenced during the year in order that trained men might be ready to meet the more intensive operation anticipated

The duties of an Aerodrome Officer are diverse and responsible Not the least in importance is the co-ordination of the services on his section of the airway It is necessary for a responsible officer to be in control at the aerodrome whenever aircraft are flying in the section and with the increased traffic a regular system of watch keeping becomes essential In this way the air line pilot can rely on the organization provided and can be assured that he will receive timely technical advice

Wireless—Without an organized system of ground wireless stations aircraft cannot operate with regularity. The present organization is barely able to cater for the existing traffic on the trans India route and the personnel manning the wireless stations have had to work long hours in order to do so. The following steps are now being taken for the improvement of the wireless services —

(i) The recruitment and training of additional personnel so as to provide a 24 hour watch keeping service between Karachi and Calcutta and a 15 hour service elsewhere on the route

(ii) The provision of quarters to house the additional personnel near the wireless stations which are frequently situated in isolated places

(iii) The substitution of Adcock direction finding stations on the night flying routes for the Bellini Tosi equipment at present in use. The latter apparatus suffers from the defect of unreliability at night a disadvantage which the Adcock system of balanced aerials has overcome

(iv) The provision of an alternative short wave channel for point to point communication to relieve the congestion on the existing medium wave system which is at present used for all communications

The short wave channel should also prove of value for aircraft communications when atmospheric conditions interfere with operation on the medium wave band

(v) New wireless stations are being provided on the Karachi Secunderabad section of the Karachi Madras route. The equipment of the Karachi Lahore route with wireless stations has been postponed in its entirety as has also the section of the Karachi Madras route beyond Secunderabad

Meteorology—It is necessary to expand the meteorological service to serve the needs of civil aviation particularly in view of the inauguration of night flying on the trans India route. In the past the meteorological service for aviation has suffered certain disadvantages owing to the fact that meteorological officers have not in all cases been located at the aerodromes which they have to serve. Steps are now being taken to provide accommodation for meteorological staff at all the main aerodromes. At the same time an increase in staff is demanded in order to meet the extended hours of watch which will be necessary. Meteorological observations by night present new problems for solution and the upper air observatory at Agra is being expanded to provide the appliances necessary

Aerodrome buildings—The accommodation requirements at aerodromes need careful co ordination as between the various departments concerned At an important airport such as Karachi, apart from aerodrome staff which includes also the aircraft inspection staff the demands of meteorological wireless postal, customs health and police authorities have all to be met The comfort of the travelling and visiting public has to be considered and provision made for their rest and refreshment An administrative building has been constructed at the Delhi aerodrome during the year and was opened by His Excellency the Viceroy in February 1936 being named the Willingdon Air Station This building is illustrated on the opposite page It is designed on the most up to date lines and is the first of its kind to be erected in India It will serve as a model for the much larger building which will be needed at the Karachi Airport At the Calcutta aerodrome an administrative building of intermediate size will be required, but the present programme does not provide for the full development of this building A feature of the design of these administrative buildings is the provision of a control room for the Aerodrome Officer, with a wireless room in immediate proximity Immediately below the control room the meteorological staff are housed so that rapid inter communication and co ordination of the three essential services for aviation can be provided Until the augmentation of staff has been effected and the programme fully developed it will not be possible, however to take full advantage of this improved lay out At other aerodromes provision has been limited to an office building designed with a view to future expansion, or the accommodation essential to immediate requirements has been provided in annexes to the new hangar buildings

Quarters to provide accommodation for the increased aerodrome and meteorological staffs require to be constructed In the present programme these quarters have been limited to watch keeping personnel whose presence at the aerodrome is essential at all times

Willingdon Air Station, Delhi Aerodrome

REVISED CAPITAL WORKS PROGRAMME.

NOTES—

* Indicates a new aerodrome or landing ground

§ Aerodrome Lighting equipment includes — Boundary lights, obstruction lights, location beacons, illuminated wind T's and floodlights Landing ground equipment is similar, but without floodlights, landings being made with the aid of flares

† New aerodrome provided by the Hyderabad State

Town, Aerodrome (A) or Landing Ground (L G)	Work on landing area	Buildings	§Lighting	Wireless	Meteorology	Deferred items
			I Trans India Route			
Karachi (A)	Complete reconstruction of the aerodrome	Hangar, 380 ft span, Administrative building and quarters Minimum requirements of Sanitary Airport	Aerodrome equipment	(Adcock D/F and short wave W/T previously installed)	New meteorological station in administrative building	Sanitary Airport (Completion)
Hyderabad (L G)			Landing ground equipment (Route beacon previously installed)			
Dharo Naro			Route beacon			
Uterlai (L G)			Landing ground equipment (Route beacon previously installed)			

Town, Aerodrome (A) or Landing Ground (L. G.).	Work on landing area	Buildings	§Lighting	Wireless	Meteorology	Deferred items
		I. Trans-India Route—*contd.*				
Jodhpur (A) .	(Aerodrome already organised by Jodhpur Government).	(Buildings already provided by Jodhpur Government)	(Aerodrome equipment previously installed by Jodhpur Government)	Adcock D/F Station.		..
Merta Road (L. G.)	..	.	Route beacon			
Rewari . .	..		Route beacon			..
Delhi (A) .	General improvement of aerodrome and construction of runways	Hangar, 100 ft span, Administrative buildings and quarters	Aerodrome equipment	Adcock D/F Station and short wave W/T	Meteorological Office in administrative building	..
Etah .			Route Beacon			..
Cawnpore (A) .	General improvement of aerodrome	Office, buildings and quarters	Aerodrome equipment			..
Allahabad (A) .	General improvement of aerodrome	Hangar, 150 ft span, and quarters.	Aerodrome equipment	Adcock D/F Station	Meteorological Office in hangar annexe	..
Mughal Sarai .	..	.	Route beacon			..
Gaya (A) . .	General improvement of aerodrome and construction of runways.	Office buildings and quarters	Aerodrome equipment	Adcock D/F station.	Meteorological Office in C A Office, and quarters	..
Asansol (L. G.) .	..	...	Route beacon .	..	..	..

Calcutta (Dum Dum) (A)	General improvement of aerodrome	Hangar, 150 ft span, Administrative building and quarters	Aerodrome equipment.	Adcock D/F station and short wave W/T	Meteorological Office in Administrative building and quarters	..
Chittagong (L G)	General improvement of landing ground					..
Akyab (A)	General improvement of aerodrome and construction of runways	Hangar, 100 ft span Office buildings and quarters	Aerodrome equipment		Meteorological Office in C A Office and quarters	..
Bassein (L G)	Enlargement of landing ground and construction of runways					..
* Rangoon (A) (Okkyin)	Construction of new aerodrome	New hangar, 150 ft span, Office buildings and quarters (Hangar from Mingaladon to be re erected at Okkyin)	Aerodrome equipment	Short wave W/T	Meteorological Office in C A office and quarters	..
II —Karachi Bombay Madras Route						
* Mughal Bhin (L G)	Construction of new landing ground					*Lighting* —The lighting of this route for night flying has been postponed with the exception of one complete aerodrome equipment at Bombay and one landing ground equipment and one beacon for the terminal part of the route near
* Ahmedabad (A)	Construction of new aerodrome	Office building and quarters.		Adcock D/F Station		
* Dharampore (L G).	Construction of new landing ground					

Town, Aerodrome (A) or Landing Ground (L.G.)	Workshop facilities [illegible]	Buildings	Lighting	Wireless	Meteorology	Other Information
II. Karachi–Bombay–Madras Route—contd.						
[illegible] (A)	[illegible] ways	[illegible] with [illegible] Aerodrome staff	[illegible]	Wireless station with [illegible]	[illegible] Quarters for staff	*Wireless.*—[illegible] with wireless [illegible] and with [illegible] Aerodrome [illegible] and [illegible]
[illegible] (A)				[illegible]		
*[illegible] (L.G.)	[illegible] ground		.		.	*Meteorology.*—Certain meteorological [illegible] have been [illegible]
*[illegible] (L.G.)	[illegible] ground	.		.	..	
Madras (A)		[illegible]				Completion of this aerodrome [illegible]
*[illegible] (L.G.)	[illegible] ground					

III.—Karachi Lahore Route

Jacobabad (L. G.)	General improvement of landing ground. Construction of runway	Small hangar offices and quarters				
Multan (L. G.) .						Acquisition of landing ground postponed
Lahore (A)	Extension and general improvement of existing landing ground	Hangar 100 ft span. Offices in annex. Quarters for staff				*Lighting.*—The lighting of this route for night flying has been postponed. *Wireless.*—Wireless stations at Jacobabad and Lahore postponed. *Meteorology.*—Quarters postponed.

GENERAL.

Operational Equipment—Rapid progress is being made with the installation of lighting equipment on the trans India route and it is anticipated that all the installations to be provided under the Capital Works Programme will be completed during 1936

During 1935 the following equipment was placed in operation —

Dum Dum (Calcutta)	Combined floodlight beacon
Karachi	Experimental floodlight and beacon (in addition to existing combined floodlight beacon)
Jacobabad .	Combined floodlight beacon
Uterlai . .	Airway beacon
Hyderabad . .	Do
Allahabad . .	Low power aerodrome beacon.
Sukkur . . .	Do

In addition, the Jodhpur Durbar provided two fixed floodlights, an illuminated wind indicator and an airway beacon, and boundary lights have since been installed, thus completing the lighting equipment of Jodhpur aerodrome

The Uterlai beacon is of a special experimental type By means of an alteration in the character of the light a pilot is afforded an indication as to whether he is on his correct course or not This beacon, which is extremely powerful, has been reported to be visible at a distance of 105 miles

A sum of Rs 13,000 approximately was expended during 1935 36 on general operational equipment for use at aerodromes and landing grounds The material purchased included a motor ambulance for Akyab, fire fighting, medical and first aid equipment, and such necessary accessories as signal pistols, flares and other signalling apparatus

Budget—Maintenance, Equipment and Minor Works.—The budget estimates for 1935 36 included a provision of Rs 2,10,000 for works services, consisting of maintenance and repairs, aerodrome equipment and minor works The final allocation for the year and the budget estimates for 1936 37 are shown below —

	1935 36 Final grant	1936 37 Budget Estimates
	Rs	Rs
Maintenance and repairs . .	1,06 000	2,25 000
Aerodrome equipment . .	50 000	*9,100
Minor Works . . .	31,000	30,000
Departmental charges . . .	9,800	20,000
	1,96,800	2,84,100

* NOTE.—An additional sum of Rs. 74 000 has been provided for equipment under "Capital"

APPENDIX 15.

Fatality and accident rates in respect of Major Accidents to Indian Aircraft.

	1935.	1934	1933.	1932.
(1) Aircraft hours flown	27,325	18,413	15,240	11,550
(2) Aircraft miles flown (Approx.)	2,377,574	1,624,895	1,200,000	992,000
(3) Accident involving fatalities—				
(a) Crew	5	3	..	1
(b) Passengers	4	..	..	1
(c) Other persons	1	1	..	..
(4) Non fatal accidents involving serious injuries—				
(a) Crew	..	2	3	2
(b) Passengers	..	..	..	..
(c) Other persons	..	..	..	..
(5) Number killed—				
(a) Crew	6	3	..	1
(b) Passengers	6	..	..	1
(c) Other persons	2	1	..	..
(6) Number of seriously injured—				
(a) Crew	2	4	3	2
(b) Passengers	..	..	..	..
(c) Other persons	..	..	..	..
(7) Miles flown per fatality	125,662	406,224	..	496,000
(8) Miles flown per serious injury or fatality.	148,598	203,112	400,000	248,000

GIPD—M115Dr of CA—21-8 36—450.

The maintenance equipment supplied during the year under report included one grader four tractors four 6 ton triple rollers five mowers and six carts

Approval of Aerodromes and Landing Grounds —Aviation cannot develop without aerodromes, those who might contemplate their provision hold back waiting for more aeroplanes to appear in the sky or expect assistance to be forthcoming from the Central Government whose available funds are concentrated on the development of the regular air routes Undoubtedly the Indian States have given a lead in this matter followed by the Government of Bengal

Experience in other countries has shown the need for foresight in the early reservation of aerodrome sites and it is to be hoped that Local Governments and municipal bodies will devote some attention to this subject

An aerodrome or landing ground must be approved for commercial use, and in the case of permanent grounds an officer of the Directorate of Civil Aviation, or a selected "B" licensed pilot is deputed to inspect and report on the ground in order that it may be approved Standardisation in aerodrome layout marking and equipment is a matter of great importance and now that the need for aerodrome development is being appreciated the issue of instructions in this matter becomes desirable, and legislation is proposed to ensure the maintenance of minimum safety requirements at aerodromes

Many landing grounds are used for temporary joy riding purposes by small aircraft, most of which grounds would be unsuitable for permanent development, but may serve their immediate purpose at the particular season of the year Certain ' B licensed pilots are approved to select these sites, which are reported to the Directorate and may then be used for the purpose in view

The following statement illustrates the increase during the past three years in the number of aerodromes and landing grounds established on a permanent basis and approved for commercial use and indicates also the considerable number of approved temporary sites at the close of the year under report —

	Approved permanent aerodromes or landing grounds	Temporary sites approved
	85	*
1933	103	*
1934	121	61
1935		

* No records are available

Landing grounds acquired from Royal Air Force.—The landing grounds at Mergui, Kadwe and Moulmein on the route between Rangoon and Victoria Point were taken over from the Royal Air Force on 1st August and they now form part of the permanent organisation of the trans India route The landing ground at Jacobabad was also taken over for development as a civil aerodrome

Aerodromes constructed by Local Governments.—In connection with the operation of an ambulance aeroplane (referred to in Section I), the Government of Bengal has prepared landing grounds at Berhampore, Midnapore, Jessore and Jalpaiguri, and has acquired land for the same purpose at Mymensingh There is also a proposal to construct a landing ground at Noakhali With the exception of Berhampore, these landing grounds are not open to commercial use

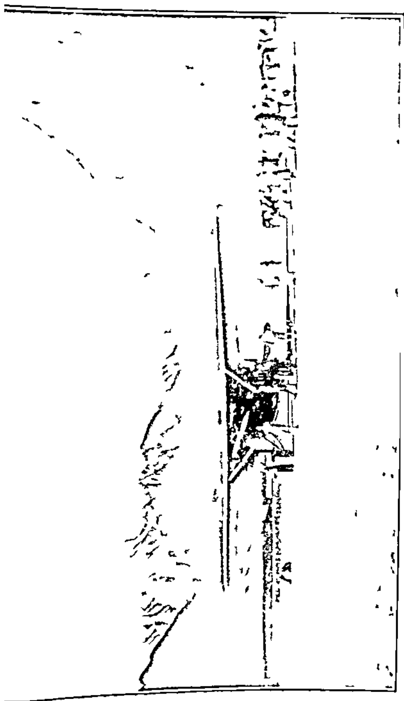
Aerodromes constructed by private enterprise—Two new civil aerodromes constructed by private enterprise were licensed for public use during the year, the Alipore aerodrome, Calcutta, belonging to Indian National Airways, Ltd and the Jamshedpur aerodrome established by the Tata Iron and Steel Co, Ltd An additional private landing ground for use in connection with their Hardwar Gauchar service was prepared at Agastmuni, United Provinces, by Himalaya Airways, Ltd

Aerodromes and Landing Grounds in Indian States—Good progress has been made with the construction of aerodromes and landing grounds in Indian States Landing grounds were established during the year under review at the following places, in addition to other landing grounds prepared for private use —

Sirohi	Jamnagar (Nawanagar)
Bahera (Panna)	Sanganer (Jaipur)
Porbandar	Swai Madhopur (Jaipur)
Bhuj (Kutch)	Gajner
Dharampur	Bikaner
Trivandrum (Travancore)	Baripada (Mayurbhunj)

Indore

Other important States, e g, Mysore, Kashmir, Rewa Rajpipla, Phaltan and Wankaner have definite schemes under consideration for the establishment of landing grounds in their territories Work has been started on the landing ground at Begumpet (Hyderabad) and H E H the Nizam's Government is contemplating the preparation of several other landing grounds in the State



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The number of aerodromes and landing grounds of which notification had been received from each State up to the end of 1935 was as follows :—

* State.	Aerodromes and landing grounds normally maintained in good condition.	†Other landing grounds.
Jodhpur	13	..
Jaipur	3	5
Hyderabad	..	2
Junagadh	2	..
Bikaner	2	..
Travancore	2	..
Patiala	1	1
Aundh	1	..
Dholpur	1	..
Idar (Mahirkantha)	1	..
Nawanagar	1	..
Limbdi	1	.
Loharu	1	.
Panna	1	..
Jind (Punjab)	1	..
Sirohi	1	..
Udaipur	1	..
Bhuj (Kutch)	1	..
Indore	1	..
Porbander	1	..
Dharampur	1	..
Baroda	..	1
Bhopal	..	1
Kolhapur	..	1
Rampur	..	1
Wankaner	..	1
Rewa	..	1
Kashmir	..	2
Phaltan	..	1
Rajkot	..	1
Radhanpur	..	1
	37	19

NOTES.—*Permission to use the landing grounds in certain States is subject to application being made in advance.

† This list includes grounds which may not necessarily be maintained in good condition, together with a number of grounds reported to be available, but details of which have not yet been received.

Airway Control—For the purpose of operational control the airways of India have been divided into sections, as shown below, each section being placed under the charge of the Aerodrome Officer at the aerodrome controlling that section

Controlling Aerodrome	*Limits of Section*
	Trans India Airway
Karachi	Gwadar to Jodhpur
Jodhpur	Within State boundaries
Delhi	Jodhpur to Cawnpore
Allahabad	Cawnpore to Gaya
Calcutta (Dum Dum)	Gaya to Burmese frontier
	Burma Airway
Akyab	Burmese frontier to Bassein
Rangoon	Bassein to Siamese frontier
	Karachi Madras (Ceylon) Airway
Karachi	Karachi to Kathiawar State frontier
Ahmedabad	Kathiawar State frontier to Bombay
Hyderabad	Within State boundaries
Madras	Hyderabad to Palk Straits.
	Karachi Lahore Airway
Karachi	Karachi to Hyderabad (Sind)
Jacobabad	Hyderabad (Sind) to Multan
Lahore	Multan to Lahore including the North Western area

The Aerodrome Officer in charge of a controlling aerodrome renders all possible assistance to aircraft flying within the section for which he is responsible He passes information as to their movements further along the route in order that wireless stations and lighting may be available at the appropriate times and he issues any special warnings or information which may be necessary for the safe and efficient operation of the route For example, in the event of a D/F Station, airway beacon, or landing ground becoming unserviceable the controlling aerodrome is responsible that a warning is issued by wireless to aircraft flying within the section and to the controlling aerodrome or aerodromes immediately adjacent

Wireless Services—A new aeronautical wireless station was constructed at Tavoy in Lower Burma and opened for service in October, 1935 This provides a useful link on the routes connecting Rangoon with Victoria Point and Bangkok There are now 13 wireless stations serving the trans India route, namely —

Karachi	Chittagong
Jodhpur	Akyab
Delhi	Sandoway
Allahabad	Bassein
Gaya.	Rangoon.
Calcutta.	Tavoy
Victoria Point	

Improvements were carried out at certain wireless stations especially in connection with the direction finding installations

Owing to the increase in frequencies of the air mail services the work of the aeronautical wireless stations again increased as will be apparent from the following comparison between the number of messages passed in 1934 and 1935 —

	1934	1935
Messages between aircraft and ground stations	14,000	2[illegible],000
Messages between ground stations themselves	106,000	130,000

The international aeronautical Q code was introduced in India for aircraft communications during 1935 The code tends to reduce the length of messages passing and an abbreviated code was also introduced for messages between aerodromes relating to aircraft movements with the same object in view

Special wireless arrangements were made in connection with flights of R A F aircraft and tours of H E the Viceroy

Meteorological Services —As air services increased on the trans India air route and existing services duplicated their running, it became difficult for the two forecasting centres at Karachi and Calcutta to serve each aircraft on this long route individually as heretofore The meteorological arrangements for this route were accordingly placed on a routine basis at the end of 1934 The route is divided into six sections Karachi Jodhpur Jodhpur Allahabad Allahabad Calcutta Calcutta Akyab Akyab Rangoon and Rangoon Victoria Point and a forecast for the following 24 hours is issued each evening for each section of the route and distributed by wireless to the aerodromes principally concerned Any aircraft in flight at the time may pick up these reports The main evening forecasts are supplemented or amended if necessary, at noon each day by brief reports covering the afternoon hours, which are also distributed by wireless The diffusion of the latest news about upper winds as well as the current weather report from stations along the air route has been similarly placed on a routine basis In addition to these reports which are issued twice daily an aircraft in flight can obtain through W/T on request a special up to date current weather report at any time Arrangements also exist at stations along the trans India route for keeping a watch for such phenomena as are dangerous to flying and to report their onset by wireless to neighbouring aerodromes and to aircraft in flight and also to send out a message as soon as weather conditions show improvement

The international code on which the current weather code was based was revised in 1935 and steps were taken to bring the new code into force in India on the 1st March 1936 in consideration of the demand by pilots for information concerning

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the height of the cloud base which was previously omitted from the code The introduction of the international aeronautical Q Code opened out another avenue for exchange of weather information, in a brief form between aircraft in flight and the surface observatories.

The meteorological facilities which were sanctioned on a temporary scale with effect from December, 1934, in connection with the Karachi Lahore air service were later sanctioned as a permanent measure Due to the diversion of the Karachi Lahore air route, the pilot balloon station at Sukkur was shifted to Jacobabad Arrangements were made to supply meteorological reports to the newly inaugurated air mail service between Trivandrum and Bombay In connection with the Hardwar-Gauchar air service, steps were taken to start a non instrumental observatory at Gauchar The long contemplated shift of the pilot balloon station from Muscat to Sharjah (which is a regular halting place for aeroplanes of the Imperial Airways), was also effected during the year on the accommodation for office and staff being made available The pilot balloon observatory at Silchar was shifted to Tavoy soon after the establishment of a W/T station at the latter place

During the calendar year 1935, about 8,044 weather reports and forecasts were issued, representing an increase of nearly 54 per cent over the issues of the previous year Out of these forecasts and reports 4,407 were supplied by Karachi, 2,941 by Calcutta and 696 by Poona The number of special current weather reports supplied to aircraft in flight, and warnings of adverse weather and improvement thereof are given in the table below —

Station	Number of SPEMET reports supplied	Number of DDMET MMMET reports supplied
Karachi	399	74
Jodhpur	318	26
New Delhi	145	20
Allahabad	267	29
Calcutta	269	92
Chittagong	346	16
Akyab	459	70
Sandoway	439	26
Bassein	649	7
Rangoon	682	14
Victoria Point	250	2

In addition to the above, 656 current weather reports were supplied by observatories along the Karachi-Madras air route. Every encouragement is given for the establishment of personal contact between pilots and meteorological officers.

As in the previous year, arrangements were made for the training and examination in meteorology of candidates for the pilot's 'B' licence; four candidates were trained or examined at Poona, eight at Karachi and one at Bombay. Two Aerodrome Officers also received training in meteorology at the Karachi Meteorological Office.

SECTION IV.

ADMINISTRATION.

CIVIL AVIATION BUDGET.

The provision for Civil Aviation (excluding expenditure of a capital nature) in 1935 36 and the budget for 1936 37 are shown in the table below —

—	Budget 1935 36	Net final appropriation 1935 36	Budget 1936 37
	Rs	Rs	Rs
1 Direction	4,10 700	4 91,910	7,50,900
2 Works	2,10 000	1 96 800	2,84 100
3 Wireless services	4,60 000	5,50,000	6,50 000
4 Grants to Clubs	1,58 000	1,33,000	1 50,000
5 Other grants for aviation purposes	2 76,300	2,94 090	4,18,000
6 Expenditure in England on pay, scholarships, etc	1 04 000	91,700	1,27,000
Total	16,19 000	17,57,500	23,80 000

Direction.—The large increase under the head 'Direction' will at once be noticed and is due to the expansion of aerodrome and inspection staff

Early in 1935 it was realised that traffic on the trans India route was increasing beyond the limit which the existing staff could handle Moreover, it was foreseen that the traffic would increase further and that as soon as the route was equipped for night flying additional personnel would be necessary to maintain watches by night as well as by day The training of new staff takes time and action could no longer be deferred The increase of staff comprises two Aerodrome Officers, 20 Assistant Aerodrome Officers, additional clerks, motor drivers and floodlight operators, the latter being necessary to operate the new lighting equipment and vehicles such as ambulances and tractors which are now being supplied This recruitment was commenced towards the end of 1935 and will be completed during the present year

Provision has also been made for the training of Aerodrome Officers in navigation, first aid, etc Allowance has also been made for these officers to undertake flights for the purpose of inspecting their aerodromes or the subsidiary landing grounds and lights for which they may be responsible

The aircraft inspection staff employed in the past has formed the barest nucleus, Karachi and Calcutta being the only outstation

office. The aircraft inspection officers have had to undertake long tours involving extensive periods of absence from their normal stations, in addition to which they may be called upon at any time to undertake journeys to investigate aircraft accidents. With the development of internal feeder routes it was obviously necessary to establish additional aircraft inspection offices. The establishment is now being increased by three Aircraft Inspectors, five Assistant Aircraft Inspectors and the necessary clerical staff. New offices are being opened at Bombay, Delhi and Rangoon. There has been considerable difficulty in recruiting men of the requisite experience for the higher posts; a new grade of examiner has therefore been created so that India may in time become independent of outside recruitment and develop its own aircraft inspection service.

Provision is also made under the head Direction for the cost of additional technical equipment which will be necessary to equip the new outstation offices.

It may be remarked that the present expansion is being carried out without any commensurate increase in the headquarters establishment. The growth of the work at headquarters may be gauged from the following figures of the receipts and issues in the past three years:

	Receipts and issues
1933	26 587
1934	38 727
1935	50 913

A staff of 67 is employed at headquarters, of whom six are Europeans and 61 Indians. The outstation staff numbers 80, of whom four are Europeans and 76 Indians.

The expansion of aviation in India during the past six years is illustrated in the graphs facing pages 18 and 52. Attention is drawn in particular to Graph IV (overleaf) which shows the steady increase in the sums collected in respect of taxes, duties, fees, etc., in connection with civil flying.

The figures for 1936 may be expected to show an even greater increase and additional staff at *Headquarters* will inevitably be necessary. The same applies to the office of the Chief Aerodrome Officer at Karachi, who is responsible for the detailed administration of the air *routes* throughout India. As the items of the Capital Works Programme are completed, so does his responsibility increase. The Civil Aviation Directorate have no established code of rules. These have to be gradually built up as experience is gained and it is most important that the organization should be built up on sound lines.

At the end of 1935 the maintenance and operation of the Viceroy's aeroplane, the "*Star of India*", was transferred from the charge of the Royal Air Force to Indian National Airways, Ltd.

and the Director of Civil Aviation is now responsible for the issue of the necessary instructions to that company Under the head of 'Direction' is included the payment of Rs 24 400 to Indian National Airways for the maintenance and operation of the Government Avro X aeroplane

Works —As works executed under the Capital Works Programme are completed, so must expenditure on operation and maintenance be incurred The increase under this head for the year 1936 37 is principally due to the cost of operation of the newly installed lighting on the trans India airway Until experience of operational conditions has been obtained the exact expenditure for this purpose is difficult to assess It is probable that this lighting will not be put into full operation during 1936

Wireless services —The increased traffic on the trans India route has made it necessary to increase the wireless staff Expansion was started last year but as the training of new wireless operators occupies at least 12 months the financial effect will only start to make itself felt in the current year With additional apparatus, new wireless stations and the future necessity for watches to be kept by night as well as by day, a continuous expansion of staff will be necessary in order to provide an adequate service by 1938 The expenditure under this head is paid directly to the Posts and Telegraphs Department

Grant to clubs —The budget figures for 1936 37 remain substantially the same and this matter is dealt with in detail in Section II

Other grants for aviation purposes —The remission of revenue totalling Rs 2 53 000 is included under this head in respect of housing and landing fees and rebate on petrol tax conceded to Imperial Airways Ltd and Indian Trans Continental Airways, Ltd

The increase in real expenditure here shown is due to the grant of a special subsidy of Rs 1 lakh to Indian National Airways, Ltd , the reasons for which are fully given in Section I

A sum of Rs 88 000 accrued in 1935 36 to the petrol tax fund from the tax on petrol consumed for aviation purposes This can be utilised for the grant of aviation scholarships and for experimental purposes A sum of Rs 23 000 is being utilised in 1936 37 to increase the total grant to flying clubs to Rs 1 50 000

During the year 1935 36 funds amounting to Rs 53 500 were sanctioned for the following major objects —

(a) Financial assistance to Ground Engineer apprentices for training in aeronautical engineering

(b) Scholarship and financial assistance to a research student to develop the properties of an aeroplane wing device invented by him

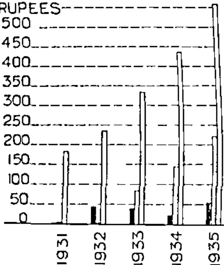
GROWTH OF AVIATION IN INDIA

IV

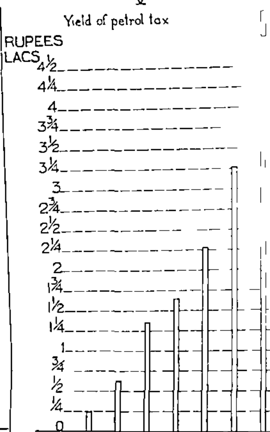
A Petrol tax fund expended

B Refund of duties, value of free facilities, etc.

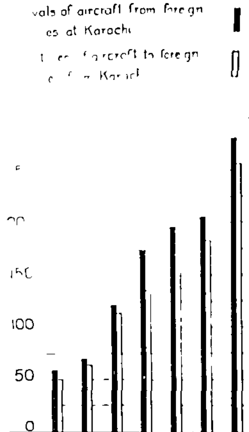
C Total amount of taxes duties fees etc in connection with aviation (including A & B)



V



VI



(c) Scholarship to three students for training as wireless operators

(d) Lighting of W T masts at Mingaladon (Rangoon) by a new method

(e) Provision of an experimental beacon at Jodhpur

(f) Provision of an Osira floodlight for test at Safdar Jang tomb near the Delhi aerodrome

(g) Provision of an experimental beacon at Hyderabad

(h) Installation of a G E C neon beacon at New Delhi for test

(i) Provision of portable neon lights for experimental use as obstruction lights or for assisting night landings

The increase from year to year in the yield of petrol tax and the sums of the petrol tax fund expended will be seen in Graphs IV and V

Expenditure in England on pay, scholarships, etc —The greater part of the sum under this head is on account of overseas pay leave pay cost of recruitment etc incurred by the High Commissioner It also includes financial assistance which is being made to a research student from the petrol tax fund and to the engineering training of two scholars who it is hoped will ultimately become Assistant Aircraft Inspectors

LEGISLATION AND ADMINISTRATIVE INSTRUCTIONS.

No fresh legislation was undertaken during the year Owing to the necessity for consulting the various interests concerned it was not found possible to publish during 1935 the new rules framed under the Indian Aircraft Act 1934 as was anticipated in last year s report It is now expected that these rules will be brought into force by the end of 1936

India was represented at the 23rd Session of the International Commission for Air Navigation held at Brussels in May 1935 by Mr J A Shillidy, C S I I C S

An improvement in the method of disseminating information by means of Notices to Airmen was introduced in November 1935 The notices are now divided into three classes distinguished by colours and an index to those notices remaining in force will now be published from time to time for ease of reference

Red notices are used for navigational information and warnings, white for amendments to regulations and miscellaneous instructions and blue notices for information correcting or amplifying the Air Pilot of India and Burma 90 Notices to Airmen were issued during the year 1935

The Air Pilot of India and Burma which was first published in 1933 and which contains particulars of aerodromes and other aids to navigation is now badly out of date and requires revision This work together with the preparation of special maps over printed with air information in accordance with the resolutions

of the International Commission for Air Navigation, which had previously been started, has had to be put on one side in order to deal with current matters of greater urgency With the standardisation of aerodrome licensing requirements, the introduction of which is proposed in the revised Indian Aircraft Rules, it will be necessary to catch up these arrears

During 1935, 16 printed Instructions to Aerodrome Officers were issued and a good deal of work remains to be done in consolidating instructions which have issued in memoranda form

Circular memoranda were issued during 1935 to the flying clubs in order to standardize the curricula of flying training and the procedure for the conduct of technical examinations

DEPUTATIONS.

Mr A W H Dean, I S E , Superintending Engineer, Aviation Circle, Central Public Works Department, was placed on deputation during leave out of India with a view to visiting the aerodromes at Amsterdam and Rotterdam and discussing drainage and other problems with the Netherlands engineers His report has since been received Mr G M Randall, Chief Aircraft Inspector was placed on deputation in the Aeronautical Inspection Directorate of the Air Ministry with a view to becoming *au fait* with the most recent developments connected with aircraft inspection

LICENCES AND CERTIFICATES.

Comparative figures showing the number of licences and certificates issued in 1934-35 respectively, together with the totals current at the end of both years, are given in the following table

LICENCES AND CERTIFICATES ISSUED AND CURRENT DURING 1934 AND 1935

Licences and Certificates	Issued during 1934	Issued during 1935	Current on 31st December 1934	Current on 31st December 1935
Pilots' 'A' licences . .	100	104	231	234
Pilots' 'A 1' licences (Limited Commercial pilot)	4	8	8	8
Pilots' 'B' licences	12	20	45	52
Pilot Instructors' Licences	4	1	17	13
Wireless Operators' Licences	1	2	1	2
Navigators licences	1	1	1	2
Ground Engineers' Licences	32	30	52	71
Certificates of Airworthiness	37	31	62	66
Certificates of Registration	37	31*	102	110

* The figures include only new certificates issued Figures of aircraft re registered have been excluded

Personnel.—The growth in the number of licensed personnel of all categories included in the above table while not spectacular, shows a steady increase from year to year and this may be regarded as perhaps the best index to the expansion of Indian civil aviation generally, and to the success of the efforts that have been made to train Indians as pilots and ground engineers The only decrease shown is in the number of licensed pilot instructors and this is due to a number of European instructors having left the country In 1935 approximately 56 % of the licensed personnel were Indians The total licences current on 31st December of each year from 1932 to 1935 were as follows —

—	1932	1933	1934	1935
Total licensed personnel	2[illegible]	306	355	389

A considerable improvement has been made in the arrangements for the medical examination of commercial pilots In the interests of safety these pilots are required to undergo a strict medical inspection every six months A few years ago medical examinations were held only at Ambala under arrangements with the Royal Air Force and pilots were obliged to attend there for examination no matter where in India their work might lie Today, however, civil aviation medical officers are available at seven centres namely, Calcutta, Madras Bombay Karachi Delhi Lucknow and Lahore and an additional officer will be appointed shortly at Rangoon

Another measure which has added to the convenience and speed of the licensing arrangements is the grant of authority to the Aerodrome Officers at Calcutta Rangoon and Karachi to renew pilots' licences of all grades The position will be further improved when new aerodrome offices are opened at the other centres Pilots passing through these aerodromes or residing in the surrounding areas, now have the benefit of obtaining renewals on the spot instead of sending their licences to Delhi or Simla Furthermore, the *Chief Aerodrome* Officer whose office is at Karachi, has been vested with power to validate the British licences of pilots arriving in India from the United Kingdom for flying Indian registered aircraft

Among their other duties aerodrome officers and aircraft inspectors are also required to undertake the technical examination of pilots

The special arrangements introduced in India whereby newly licensed ground engineers are given the opportunity of extending their experience and practising their calling under approved supervision has continued with success Their licences are endorsed

"valid for operation under approved supervision," and this restriction is removed as a rule after one year's work.

Aircraft.—Aircraft holding certificates of registration at the end of 1935 numbered 110, with a total horsepower of 17,761, as compared with 102 aircraft with 15,276 horsepower at the end of 1934. The following table gives the number of aircraft of various types and classifications which held certificates of registration and certificates of airworthiness during any part of the year 1935.

TYPES OF AIRCRAFT WHICH HELD CURRENT CERTIFICATES OF REGISTRATION AND CERTIFICATES OF AIRWORTHINESS ON THE 31ST DECEMBER 1935.

Types.	Aircraft Registered					Holding Certificates of Airworthiness.
	Regular Air Services	Miscellaneous Commercial Flying	Flying Clubs and Training.	Private Flying	Total.	
D H 60 Moth		2	20	11	33	25
D H 80 Puss Moth		1	2	5	8	4
D H 82 Tiger Moth			5	..	5	3
D H 83 Fox Moth	5	2	1	1	9	9
D H 84 Dragon Moth	3		.		3	2
D H 85 Leopard Moth	2	1	1	1	5	4
D H 87 Hornet Moth		3		.	3	2
D H 89 Dragon Rapide.			.	1	1	..
Airspeed Courier				1	1	1
Airspeed Ferry		1	.	.	1	1
Avro Avian			..	3	3	..
Avro Commodore			..	1	1	.
Avro X		2	..	.	2	1
Avro 642		.		1	1	1
A W XV Atalanta	2		..	.	2	2
Blackburn Bluebird		.	1	1	2	1
Cierva Autogiro		2	..	1	3	..
Comper Swift		.	1	1	2	1
Curtis Rambler	.	.	..	2	2	.
Desoutter Monoplane	.	.	.	1	1	..
Heath Monoplane	..	..	..	2	2	..
Klemm Swallow	.		..	1	1	..
Miles Hawk	..		2	4	6	2
Miles Merlin	2	..	..	.	2	1
Monospar Monoplane	..	.	1	2	3	2
Percival Gull	2	..	..	2	4	3
Short Scion Seaplane	1	..	..	..	1	..
Spartan Cruiser	..	..	..	1	1	1
Stinson Junior Monoplane.	..	..	..	1	1	..
Stinson Reliant	..	..	..	1	1	..
Total 1935	17	14	34	45	110	66
Total 1934	14	7	35	46	102	62

Of the 42 aircraft which, though holding certificates of registration, did not hold certificates of airworthiness, 10 were of foreign design and of such a type that even if they were in new condition, they would not be accepted for airworthiness in India. (The certificates of registration of 5 of these have been cancelled during 1935.) The certificates of registration of seven of the remaining 32 were cancelled during 1935 and 12 of them were not imported into India by the end of 1935 and consequently certificates of airworthiness were not issued.

The aircraft added to the Register during the year comprised 31 machines of 16 different types, with a total horsepower of 4,367, as listed below :—

AIRCRAFT ADDED TO REGISTER 1935

Number of Aircraft	Type of aircraft	Registered H P	Total H P
2	D H 60 Moth (Gipsy I)	85	170
1	D H 60 Moth (Gipsy II)	105	105
2	D H 60 Moth (Gipsy Major)	118	236
1	D H 80 Puss Moth (Gipsy III)	105	105
5	D H 82 Tiger Moth (Gipsy Major)	118	590
1	D H 83 Fox Moth (Gipsy Major)	118	118
3	D H 85 Leopard Moth (Gipsy Major)	118	354
4	D H 87 Hornet Moth (Gipsy Major)	118	472
1	D H 89 Dragon Rapide (Two Gipsy VI)	360	360
1	Avro Avian III A (Genet II)	80	80
3	Miles Hawk (Gipsy Major)	118	354
2	Miles Merlin (Gipsy VI)	180	360
1	Percival Gull (Gipsy Major)	118	118
2	Percival Gull (Gipsy VI)	180	360
1	Short Scion Senior Seaplane (Four Popjoy Niagara)	360	360
1	Stinson Reliant (Lycoming)	225	225
31			4,367

Aerodromes.—The progress made in connection with the approval of aerodromes and landing grounds is mentioned in Section III, Ground Organization (page 43). Certain commercial pilots of the requisite experience have been issued with instructions and authorised to inspect aerodrome sites on behalf of the Directorate in order that the approval required under Rule 9 of the Indian Aircraft Rules may be given. The number of persons so authorised at the end of 1935 was 23.

AIRCRAFT INSPECTION

Further inspection equipment has been added to the offices at Karachi and Calcutta and is proving valuable in assisting the staff to work to the fine limits specified by aircraft manufacturers The C F R fuel testing engine has been installed at the Alipore Test House and tests are made periodically on samples of aircraft fuels used in India Tests on lubricating oil continue periodically The trend mentioned in the last two Annual Reports of the raising of engine compression ratios to increase the power output is continuing A new development is the use of controllable pitch propellers and this again will demand a higher octane rating from the fuel used The octane rating of aviation petrol is closely associated with the reliability of the engine since most aviation motors are designed to work on fuel of specified characteristics for a predetermined life The testing of batches of fuel is therefore becoming increasingly important

A number of tests have been made during the year on materials used in aircraft construction such as duralumin high tensile steels, timbers glue fabrics etc The weathering qualities of safety glass have also been under investigation and tests are now being made on the suitability of toughened glass for use on aircraft in India The examination of Indian timbers with a view to deciding on their suitability for aircraft construction continues It is believed that suitable timbers can be obtained in India for use in aircraft construction This may prove exceedingly valuable as the supply of aircraft timbers from other parts of the world is limited and a certain amount of difficulty exists even now in obtaining suitable quantities and quality of timber for aircraft construction and repair

The use by the Inspection Offices of test equipment for aircraft engine instruments is resulting in a considerably higher standard of maintenance of such equipment and a reduced number of reported cases of unsatisfactory instruments The life of these instruments considering their fragility and their accuracy is on the whole satisfactory The weather conditions in India and Burma are exceedingly severe on such instruments and are apt to cause corrosion and excessive wear internally which effects the sensitivity of the instruments The provision of sub standard checking instruments is therefore of vital import to an inspection department dealing with such equipment One operator in India is now commencing to build aircraft from partially completed components This will prove exceedingly valuable not only from an economic point of view but also from the training angle as facilities for training young ground engineers will be greatly enhanced This however increases very considerably the work on the inspection offices responsible for the supervision and licensing of such machines

The inspection offices carried out a large number of examinations for the issue or extension of ground engineers' licences during the year The number of applicants for ground engineers' licences remains at a satisfactory level 35 Instructions to Aircraft Owners and Ground Engineers were issued during the year 1935

CUSTOMS AND HEALTH SERVICES.

Traffic through Karachi Airport has increased very rapidly and the work of the Customs and Health Services has already reached large proportions which will expand still further with the development of the Empire Air Mail Scheme The following figures illustrate the growth in traffic handled at Karachi in 1935 as compared with 1931 —

—	1931	1935
Aircraft arrivals and departures on international flights (See also Graph VI facing page 5?)	233	538
Passengers carried on regular air services to and from India	204	1,367
Transit passengers on regular services across India		486
Value of imports and exports by air Rs	13,07,688	36 68,241

A similar rate of increase, though on a smaller scale, has been registered at Rangoon Airport

Until the end of 1935, the Health Officer of the Port of Karachi was responsible for health services at the airport in addition to his work with shipping In consequence of the large growth of air traffic, however, a separate Airport Health Officer was appointed on 23rd December The rapid transit of aircraft has opened up a new channel for the carriage of disease and in particular it is necessary for measures to be taken to prevent the introduction of yellow fever into India This would now be possible as an air traveller can arrive in India from a suspected area in Africa within the incubation period of the disease The health authorities in all countries are alive to this danger which is being combated by international co operation by the formation of the Air Navigation Quarantine Commission which has been set up under the International Sanitary Convention for Air Navigation A special survey of the Karachi Airport was undertaken in 1935 with a view to making Karachi a sanitary airport.

SECTION V

ACCIDENTS

GENERAL ANALYSIS

Dur ng the year 1935 27 325 hours of flying were carried out by aircraft of Indian registration excluding the time flown by aircraft used entirely for private purposes compared with 18 413 hours of flying during the previous year In 1935 22 notifiable accidents in India were recorded compared with 26 accidents during the previous year Although there was a smaller number of accidents the consequences were very much more serious for 16 persons lost their lives as against four in the previous year, whilst three persons were seriously injured compared with four in the previous year The number of miles flown per fatality was 1 25 662

India was most unfortunate during the year 1935 in having two very serious accidents which have considerably swelled the accidents statistics One which cost four lives was due to a collision between two aircraft the other which cost three lives was due to a structural failure in the air Of the 22 notifiable accidents three occurred to aircraft registered outside India There were eight fatal accidents to aircraft of Indian registration and one fatal accident and one non fatal major accident to foreign aircraft making a total of 10 major aircraft accidents *i e* accidents which resulted in death or serious injury to personnel whether carried in the aircraft or not

Of the 19 flying accidents which occurred to Indian registered aircraft 10 resulted in the write off of the aircraft, four in damage necessitating complete overhaul and five in damage necessitating the renewal of major components Of the three flying accidents to foreign aircraft two involved aircraft registered in Great Britain and one a Roumanian machine Two of these accidents resulted in the write-off of the aircraft and one in damage necessitating the replacement of a major assembly The distribution of accidents in India is shown in Appendix 14 (pages 78 79)

CAUSES OF ACCIDENTS

In regard to the causes of flying accidents to aircraft registered in India the following table is built up from the classification given

m the Analysis Forms for the years 1932 1933, 1934 and 1935 —

Class	Nature	1935	1934	1933	1932
(A)	Collision in full flight with other aircraft	1			
(B)	Collisions in full flight with objects other than aircraft	2	3	2	1
(D)	Spins or stalls without engine failure	4	5	5	4
(E)	Forced landings	3	1	2	6
(F)	Landing accidents	4	3	8	6
(G)	Take off accidents	2	6	4	0
(H)	Taxying accidents	1	2	1	2
(X)	Structural failure	1	0	0	*1
(Y)	Indeterminate and doubtful	1			
	Total	19	20	22	20

* (Unregistered and uncertified aircraft)

The causes of accidents during the years 1932 1933 1934 and 1935 are shown in percentage form in Appendix 13 (page 77) and statistics of fatality and accident rates are given in Appendix 15 (page 80)

During the year 1935, 83 7 per cent of the blame for accidents was attributable to errors of personnel, compared with 85 per cent during the year 1934 Of this 83 7 per cent, 82 4 per cent was classified against errors of the pilot and 1·3 per cent to errors of the supervisory personnel 11·1 per cent of accidents were attributable to failure of or defects in the aircraft or engines This figure includes an accident due to power plant failure on a foreign privately-owned machine which was crossing India on a journey to the Far East

Meticulous care is taken to discover whether mechanical failure has contributed in any way to an accident and where such failure is found or suspected, immediate action is taken to avoid its recurrence One accident occurred through fatigue and fracture of a metal pipe in the engine installation These pipes were immediately replaced on other aircraft of the type by flexible pipes In one case of an airframe failure a contributory cause was probably the position of the centre of gravity and the load which the machine was carrying A power plant failure resulting in an accident was caused primarily by high oil consumption Part of the responsibility, however, rested with the pilot who was fully aware of the defect and yet continued his journey of approximately 2,000 miles, making many landings *en route*

The aircraft accidents which resulted in fatalities in 1935 are briefly described below —

Regular Air Transport—The pilot of an air mail machine, having flown through cloud and conditions of low visibility for some time, landed on a field to check his position In the subsequent take off, he taxied down the field and thereby raised a cloud of dust He then turned round and took off without first making sure that the path ahead was clear The aircraft struck and fatally injured two villagers who had come to see the machine The pilot's licence was suspended for a period of 12 months and in subsequent legal proceedings a heavy fine was imposed on him

Club Flying.—(1) The pilot of an aircraft attempted to carry out a forced landing the reason for which could not subsequently be determined Unfortunately, this forced landing was not satisfactorily accomplished and the pilot sustained injuries from which he subsequently died

(2) During the course of performing voluntary aerobatics which included inverted flying the pilot lost control of the machine and the machine crashed The pilot sustained fatal injuries

(3) The pilot was practising side-slips in the course of which he allowed the aircraft to stall, from which condition owing to low altitude he was unable to recover The machine crashed into the sea and the pilot was drowned

(4) The pilot of the aircraft having just flown over an R A F aerodrome at a speed only slightly in excess of the stalling point of the aircraft attempted to carry out a steep turn, in consequence of which the aircraft stalled and crashed It is believed that the pilot was watching the ground and his attention was diverted Both the pilot and the passenger sustained serious injuries, the passenger succumbing shortly afterwards

(5) Having taken off, the pilot immediately placed the machine in a steep climbing turn which resulted in the aircraft stalling from a height insufficient to allow recovery The machine crashed and the passenger in the front cockpit was killed

Private Aircraft.—(1) The pilot of a private aircraft carried out a right hand circuit round an approved aerodrome before coming in to land, instead of a left hand circuit, thereby contravening the air traffic rules A club aircraft which was also preparing to land and was carrying out the proper circuit was struck by the private aircraft Both the machines crashed, all the four occupants being killed on impact

(2) An aircraft left on a cross country flight carrying a load in excess of that permitted by its Certificate of Airworthiness. The weather was bumpy with low cloud After having flown for slightly over 1½ hours, the wing structure broke up and the aircraft crashed from a high altitude It is possible that the failure

occurred when the pilot was attempting to descend through the clouds and the machine was diving at high speed All the three occupants of the aircraft were killed The accident is similar to others which have occurred on the same type of aircraft, being the 10th in the series These accidents have already been the subject of extensive investigations in Great Britain

Foreign Aircraft.—In the course of a long distance record-breaking flight, an aircraft landed at an Indian aerodrome to take on supplies of fuel and oil, and subsequently left carrying a load very considerably in excess of that permitted by its Certificate of Airworthiness The machine was reported as having sub equently passed over an aerodrome 1,000 miles farther along its route After that nothing further was seen or heard of the aircraft in spite of extensive search operations and it is presumed that it was lost at sea and that both its occupants were drowned

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APPENDIX 1.

Air Mails carried by all Scheduled Air Services to and from India.

(1) Air Mails to India.

—	Imperial Airways.		K. L. M.		Air France.		Total.
	To India.	Transit mails.	From Europe.	From the East.	From Europe.	From the East.	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1929 (9 months)	21,967	16	..	..	..	..	21,983
1930 . .	39,364	359	96	..	..	..	39,819
1931 . .	45,632	840	1,047	No record.	318	No record.	47,837
1932 . .	45,111	1,766	3,216	1,366	458	79	51,996
1933 . .	55,195	4,128	4,731	1,319	834	268	66,475
1934 . .	65,795	19,338	4,977	4,454	936	588	96,088
1935—							
March quarter	21,853	11,553	901	1,654	169	136	36,266
June quarter .	21,319	12,704	1,172	1,883	194	174	37,446
September quarter.	21,476	13,660	2,516	2,749	210	189	40,800
December quarter.	25,649	18,433	2,522	610	174	156	47,544
Total for 1935	90,297	56,350	7,111	6,896	747	655	1,62,056

(2) Air Mails from India.

—	Imperial Airways.		K. L. M.		Air France.		Total.
	From India.	Transit mails.	To the East.	To the West.*	To the East	To the West.*	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1929 (9 months)	20,171	485	..	..	..	..	20,650
1930 . .	34,015	2,561	..	..	..	..	36,576
1931 . .	40,474	2,592	..	..	..	..	43,066
1932 . .	42,407	4,299	117	..	14	..	46,837
1933 . .	54,178	5,976	1,460	..	424	..	62,038
1934 . .	66,753	16,714	428	47	586	108	84,636
1935—							
March quarter	22,308	9,122	..	16	238	33	31,717
June quarter .	22,400	11,277	10	21	279	33	34,020
September quarter.	23,585	12,112	21	32	277	28	36,055
December quarter.	25,566	15,355	26	42	293	30	41,312
Total for 1935	93,859	47,866	57	111	1,087	124	1,43,104

* Mails to places in the Persian Gulf not served by Imperial Airways, Ld.

APPENDIX 2

Flights performed and Passengers and Freight carried by all Scheduled Air Services to and from India.

(1) Karachi Air Port.

—	No. of flights	Passengers		Freight (including bullion)	
		To India	From India	To India	From India
				lbs	lbs
Imperial Airways					
1929 (9 months)	80	*No record*	*No record*	*No record*	*No record*
1930	105	78	70	No record	No record
1931	104	60	74	5 489	313
1932	105	150	14[illegible]	5 073	266
1933	109	216	211	9 410	5 0[illegible]9
1934	104	280 (54)	3[illegible]6 ([illegible]1)	10 23[illegible]	4 988
1935—					
March quarter	52	96 (8)	107 (17)	8 453 (1 688)	9 266 (259)
June quarter	52	97 (10)	192 ([illegible]5)	5 694 ([illegible] 181)	5 530 (901)
September quarter	52	141 (15)	149 (14)	5 253 (1 889)	8 295 (661)
December quarter	52*	121 (18)	80 (12)	4 411 (1 900)	8 469 (260)
Total for 1935	208	455 (51)	528 (68)	23 811 (7 658)	31 560 (2 081)
Foreign Air Services					
1931	106	32	18	6[illegible]8	43
1932	190	16	30	1 231	2 686
1933	222	69	64	4 045	380
1934	209	31	71	7 662	780
1935—					
March quarter	51	16 ([illegible]9)	24 (33)	2 547 (4 482)	754 (1 300)
June quarter	58	25 (46)	3[illegible] (44)	1 945 (6 009)	1 297 (1 482)
September quarter	78	71 (49)	69 (74)	2 688 (4 975)	509 (2 224)
December quarter	[illegible]9	[illegible]4 (43)	68 (49)	2 [illegible]08 (6 562)	1 319 ([illegible] 276)
Total for 1933	266	186 (16[illegible])	198 (200)	9 388 ([illegible]20[illegible]8)	4 1[illegible]9 (7 28[illegible])

* Four extra services operated during Christmas not included.
Figures within brackets relate to transit traffic across India

APPENDIX 2—*contd*.

Flights performed and Passengers and Freight carried by Scheduled Air Services to and from India.

(ii) Rangoon Air Port.

—	No of flights	Passengers		Freight.	
		To India.	From India	To India	From India.
				lbs	lbs.
Imperial Airways and Indian Trans Continental Airways					
1933 (December quarter only)	2	.	3	.	..
1934	105	45 (21)	55 (54)	2,249	5,361
1935—					
March quarter .	25	11 (17)	17 (8)	(96)	5 (1,691)
June quarter	26	7 (26)	11 (13)	1,375 (278)	980 (3,020)
September quarter	27	7 (17)	2 (14)	1,434 (389)	804 (2,075)
December quarter .	52	27 (11)	16 (19)	887 (381)	2,120 (2,167)
Total for 1935 .	130	52 (71)	46 (54)	3,696 (1,144)	3,909 (8,953)
Foreign Services					
1932	190	41	28	128	1,351
1933	212	108	77	100	34
1934	208	42	27	4,346	6,061
1935—					
March quarter .	51	12 (29)	9 (35)	.. (1,161)	85 (4,374)
June quarter . .	59	17 (50)	14 (48)	89 (1,716)	89 (5,862)
September quarter .	77	23 (79)	8 (44)	137 (2,092)	404 (4,936)
December quarter .	78	34 (59)	25 (42)	59 (2,246)	283 (6,242)
Total for 1935 .	265	86 (217)	56 (169)	285 (7,215)	861 (21,414)

Figures within brackets relate to transit traffic across India.

APPENDIX 3

Value of Imports and Exports by Air—Karachi and Rangoon Air Ports.

—	Aircraft		Imports by Air			Exports by Air		
	Arrivals from foreign	Departures for foreign	General merchandise	Precious stones	Bullion and currency notes	General merchandise	Precious stones	Bullion and currency notes
			Rs	Rs	Rs	Rs	Rs	Rs
Karachi								
1931	122	111	1 50 601		1 06 801	4 [illegible]80		10 00 000
1932	174	161	4 09 256	4 17 72[illegible]	33 706	1[illegible] [illegible]1[illegible]8		2 00 000
1933	197	184	19 07 920	31 48 68	1 77 33[illegible]	41 [illegible]6		1 0[illegible] [illegible]00
1934	192	183	5 [illegible] 941	38 78 355	1 66 638	10 0[illegible]6	5[illegible] 983	1 [illegible]1 93[illegible]
1935—								
March quarter	64	58	2 06 502	5 39 [illegible]69	45 189	7 363	1 [illegible]0	
June quarter	59	63	2 46 7[illegible]6	5 01 [illegible]88	46 182	14 891		
September quarter	78	66	1 28 300	8 [illegible]1 135	27 329	31 751	7 000	32 000
December quarter	77	73	2 49 832	5 56 449	4 035	[illegible]6 027	[illegible]8 500	1 [illegible]00
Total for 1935	278	260	8 31 480	25 08 941	1 [illegible]3 [illegible]35	80 [illegible]3	[illegible]	[illegible]
Rangoon								
1931	57	65						4 51 7[illegible]0
1932	96	107	1 808			2[illegible]		2[illegible] [illegible] [illegible]63
1933	119	118	3 697					
1934	172	182	9 890			61[illegible]		
1935—								
March quarter	40	44	833			55		
June quarter	46	43	449					
September quarter	53	59	14 526			67		
December quarter	69	74	11 248			503		
Total for 1935	208	220	27 0[illegible]6			6[illegible]5		

APPENDIX 4.

Regularity and Punctuality of Scheduled Air Services to and from India —Karachi Air Port

Services and Period	Eastbound Arrivals					Westbound Departures				
	Sche duled	Punc tual	Delay			Sche duled	Punc tual	Delay		
			1 day	2 days	3 days or more			1 day	2 days	3 days or more
1931—										
Imperial Airways	52	35	8	6	3	53	43	6	3	1
K L M	26	16	5	2	3	24	18	5		1
Air France	18	13	3	2		17	13	3	1	
1932—										
Imperial Airways	53	36	6	7	4	52	50	1		1
K L M	52	3[illegible]	13	6	1	51	43	6	3	
Air France	43	33	7	3		43	31	8	3	1
1933—										
Imperial Airways	52	45	4	2	1	52	50		2	
K L M	52	36	12	3	1	53	49	2	2	
Air France	52	42	8	2		52	49	2		1
1934—										
Imperial Airways	52	44	8			52	46	5	1	
K L M	53	49	4			52	49	3		
Air France	52	35	10	6	1	52	47	3		2
1935—										
Imperial Airways	104	87	13	2	2	104	91	10	1	2
K L M	81	63	10	5	3	81	76	2	1	
Air France	53	40	13			52	45	6	1	

APPENDIX 5.

Air Mails carried by Trans-India Air Service

Imperial Airways, Ltd and Indian Trans Continental Airways, Ltd

Period	East bound					Westbound					Grand Total
	To India and Burma from the West	From India and Burma to the East	Within India and Burma	Transit mails	Total	To India and Burma from the East	From India and Burma to the West	Within India and Burma	Transit mails	Total	
	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
1933 (July to December)	No record	No record	No record	No record	7 797	No record	No record	No record	No record	13 [illegible]	21 [illegible]
1934	21 020	3 537	994	12 734	38 [illegible]85	1 395	34 307	1 [illegible]27	8 8[illegible]	[illegible]	[illegible]
1935—											
March quarter	9 366	1 320	342	7 861	18 889	1 130	10 412	8[illegible]0	6 8[illegible]9	19 1[illegible]0	[illegible]
June quarter	9 783	1 655	538	11 433	23 409	812	10 [illegible]11	694	9 [illegible]67	21 934	[illegible] 391
September quarter	10 068	1 751	570	12 441	24 830	663	11 337	733	10 [illegible]22	23 [illegible]	48 [illegible]
December quarter *	11 061	1 051	796	16 888	30 693	3 186	12 096	1 246	13 993	30 [illegible]	61 [illegible]
Total for 1935	40 278	[illegible] 6[illegible]7	2 246	48 6[illegible]3	97 8[illegible]4	[illegible]91	44 55[illegible]	3 533	41 240	9[illegible] 159	1 92 [illegible]

* The duplicate Service was extended to Singapore at the end of September 1935

APPENDIX 6.

Regularity and Traffic Statistics of Trans-India Air Service—Karachi-Calcutta-Rangoon-Singapore.

Imperial Airways, Ltd and Indian Trans Continental Airways, Ltd

Period.	* Services		* Percentage regularity	Aircraft mileage	Passenger ton miles	Freight-ton miles	Mail ton miles
	Scheduled	Completed					
33 (July to December)	51	50	98	97,748	12,311	1,521	12,869
34 . . .	106	106	100	381,469	78,375 4	14,159 1	71,429 2
35—							
March quarter . .	51 (25)	51 (25)	100 (100)	129,405	26,595 0	6,620 5	42,239·3
June quarter . .	52 (26)	52 (26)	100 (100)	129,945	32,801 3	6,611 4	47,294 6
September quarter . . .	53 (27)	53 (27)	100 (100)	133,638	25,365 1	5,205 1	52,336·9
December quarter . .	104	104	100	187,139	32,418 8	6,213·1	67,685 3
Total for 1935 .	208 (78)	208 (78)	100 (100)	580,127	1,17,180 2	24,650 1	2,09,556 1

* NOTE —Figures in brackets relate to the duplicate services operated between Karachi and Calcutta only between 1st January and)th September 1936 and are included in the main figures

APPENDIX 7.

Karachi-Bombay-Madras Air Mail Service.

Operational Statistics.

Period	Services			Aircraft mileage	Mails		Passengers		Freight	
	Scheduled	Completed	Percentage regularity		South bound lbs	North bound lbs	No	Passenger miles	Weight lbs	Ton miles
1932 (15th Oct to 31st Dec)	23	23	100	35,720	1 464	[illegible]	1	660	[illegible]	Not recorded
1933	104	104	100	137 280	10 346	13 130	8	[illegible]	[illegible]	Not recorded
1934	105	105	100	138 600	18 071	23 410	11	8 21	111	[illegible]
1935—										
March quarter	50	49	98	69 000	8 537	7 679	11	6 455	33	16 13
June quarter	52	50	96	71 450	7 661	8 124	3	[illegible]	[illegible]	[illegible]
September quarter	53	53	100	74 200	[illegible]	8 826	10	7 180	100	[illegible]
December quarter	52	52	100	72 960	[illegible]	9 418	16	[illegible]	101	[illegible]
Total for 1935	207	204	98 5	2 87 610	33 548	34 077	40	26 005	[illegible]	[illegible]

APPENDIX 8.

Karachi-Lahore Air Mail Service.

Operational Statistics

Period	Services			Aircraft mileage	Mails		Passengers		Freight	
	Sche duled	Com pleted	Percen tage re gularity		North bound lbs	South bound lbs	No	Passenger miles	Weight lbs	Ton miles
1934 (4th to 31st December)	8	8	100	5 328	1 520	1 015				
1935—										
March quarter	52	45	87	31 944	2 684	2 885	1	666	61	18 1
June quarter	51	51	100	36 514	3 124	3 163			14	4 2
September quarter	53	53	100	39 090	3 147	3 189				
December quarter	52	54*	100	39 626	3 738	3 768	1	234		
Total for 1935	208	203*	97	1 47 174	12 693	13 005	2	900	75	22 3

*One Northbound and one Southbound service was duplicated to cope with the Christmas mails in December 1935

APPENDIX 9.

Bombay-Trivandrum Air Service.

Operational Statistics

Period.	Services.		Percentage regularity	Aircraft mileage	Mails		Passengers		Freight.
	Scheduled.	Completed			South bound	North bound	Number	Passenger miles	
					lbs	lbs			lbs
1935—December quarter	19	19	100	14,910	59	21	11	[illegible]	

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]				[illegible]		[illegible]		[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

APPENDIX 11.

Calcutta-Dacca Air Service (Suspended).

Operational Statistics

Period.	Services.			Aircraft mileage.	Mails		Passengers		Freight.	
	Sche-duled.	Com-pleted.	Percen-tage regu-larity.		East-bound lbs	West bound lbs	No	Passenger miles	Weight lbs	Ton miles
1933 (December only)	62	62	100	9,500	21	75	105	[illegible]	[illegible]	[illegible]
1934	734	731	99·6	111,701	350	1,269	501	[illegible]	[illegible]	[illegible]
1935—										
March quarter	83	83	100	21,676	152	359	150	[illegible]	[illegible]	[illegible]
June quarter	44	44	100	19,096	98	176	109	15,904	233	[illegible]
Total for 1935	254	254	100	40,772	250	535	208	35,911	3,732	[illegible]

The service ceased operation with effect from the 15th June 1935

APPENDIX 12.

Summary of the work of the Flying Clubs, 1935.

Flying Clubs.	Number of members			Aircraft No.	No. of hours flown.			Total Flying.	Subsidy earned.
	European.	Indian.	Total		Instructional.	Other flying by members.	Miscellaneous and Commercial flying.		
Subsidised.									Rs
Bengal (Dum Dum)	113	125	238	2	464	495	105	1,064	20,000
Bombay	178	343	521	4	604	1,159	384	2,147	19,100
Delhi	63	122	185	4	409	344	63	816	19,600
Karachi	71	59	135	4	542	1,369	496	2,407	21,000
Madras	102	127	229	3	262	663	470	1,395	19,500
Northern India (Lahore)	9	107	116	3	248	250	130	628	17,000
U. P. (Cawnpore and Lucknow).	69	117	186	3	338	823	238	1,399	18,500
Unsubsidised.									
Jodhpur	21	23	44	6	55	58	147	260	Unsubsidised.
*Indian National Airways, Rangoon Flying School	..	..	36	3	249	495	..	744	Unsubsidised.
Total	626	1,023	1,690	32	3,171	5,656	2,033	10,860	1,34,700

*Now closed. The membership shown is the number of pupils who received instruction.

APPENDIX 13.

Analysis of causes of Accidents to Indian Aircraft.

	1935	1934	1933	1932
	Per cent	Per cent	Per cent	Per cent
Personnel	83 7	85 0	85 7	67 5
Material	11 1	5 0	2 5	18 7
Miscellaneous		10 0	12 1	8 9
Undetermined and doubtful	5 2			5 0

	1935	1934	1933	1932
	Per cent	Per cent	Per cent.	Per cent.
Errors of pilot	8[illegible] 4	3 8	85 7	6[illegible] 5
Supervisory personnel	1 3	0 2		
Other personnel		5 0		
Power plant failure	6 0	5 0	2 3	8 [illegible]
Structural failure (3)	4			10 0
Handling qualities (4)	0 [illegible]		0 2	
Weather		0 0	5 2	5 0
Airport or Terrain		[illegible] 5	1 1	
Other (5)		1 5	5 7	3 8
Undetermined and doubtful	5 2			6 0

	[illegible]	[illegible]	[illegible]	[illegible]
	Per cent	Per cent	Per cent	Per cent
Error of Judgment	14 2	[illegible]	11 2	[illegible] 5
Poor Technique	12 8	14 1	21 3	12 4
Disobedience of orders	[illegible]	3 3	5 5	5 1
Carelessness or negligence	12 6	21 [illegible]	14 9	
Fuel system (2) (8)		5 0	2 3	
Ignition system (8)	4 [illegible]			
Lubrication system	2 6			
Engine Structure (1)				[illegible]
Flight Control system				[illegible]
Aircraft Structure (7)	4 [illegible]			
Handling qualities (4)	0 [illegible]		[illegible]	
Weather		6 0	5 8	3 [illegible]
Airport or Terrain	2 [illegible]	1 1		
Other (5)		1 3	3 [illegible]	1 4
Undetermined and doubtful	[illegible] 2			[illegible]

(1) This consisted of three valve seat failures

(2) Attributed to the presence of a nut inside one of the engine cylinders which resulted in misfiring and partial engine failure

(3) This occurred on an unregistered and unlicensed aircraft

(4) This was due to flying controls being adjusted too tightly or to bad visibility from the pilot s cockpit.

(5) Includes collisions with birds people in the way on landing etc

(6) 2 5 per cent. due to defect on uncertificated aircraft

2 5 per cent due to design defect on certificated aircraft subsequently modified

(7) Consisted of structural failure in the air

(8) Due to faulty sparking plugs

APPENDIX 14.

Summary of accidents in India.

Class of Flying	1935.					1934					1933					1932		
	No of accidents			No of hours flown in year	No of hours flown per accident.	No of accidents			No of hours flown in year	No of hours flown per accident	No of accidents			No of hours flown in year	No of hours flown per accident	Accidents	No of hours flown in year	No of hours flown per accident
	Unlicenced pilot	Licenced pilot	Total			Unlicenced pilot	Licenced pilot	Total			Unlicenced pilot	Licenced pilot	Total					
Indian Aircraft Club Flying																		
Bombay	1	3	4	2 147	537		2	2	1 607	804		4	4	1 850	463	4	2 287	572
Bengal		1	1	1 064	1 064	1	2	5	2 630	787	2	2	4	1 639	410		1 667	
Delhi		1	1	816	816				687		1	1	2	1 400	700	1	1 600	1 666
Jodhpur				260					269					510		2	339	170
Kathiawar							2	2	306	153		1	1	1 017	1,017	2	259	130
Karachi		3	3	2 407	809				2 705			2	2	2 128	1,064	2	904	452
Madras		2	2	1 395	698	1	2	3	2,120	707	1	2	3	1 348	449		1 271	
Northern India				678			1	1	566	566				139		2*	208	140
Rangoon		1	1	744	744													
United Provinces				1 399					1 160		1	2	3	964	321	2	1 026	513
Total Clubs	1	11	12	10 860	905	2	9	11	11 780	1 071	5	14	19	10 995	579	15	9 717	648

Regular Air Transport		4	4	11 2[illegible]9	2,822		1	1				1	1			1		
Miscellaneous				5 1 6		2	1	3										
Private Flying		3	3	Not known	Not known	1	4	5				2	2			4		
Total Indian	1	18	19	27 3[illegible]5	1 438	5	15	[illegible]0			5	17	[illegible]			[illegible]1		
NON INDIAN AIRCRAFT																		
Hire or Reward		1	1												--			
Private Flying		2	2				4	4				2	2			2		
Total Flying	1	21	22			5	19	[illegible]4			5	19	[illegible]1			2	--	
GROUND ACCIDENTS																		
Indian Aircraft																		
Karachi Aero Club													3				--	--
Private Flying													1			--	--	--
Non-Indian Craft								2					1			--	--	
Total								2					5			--		
GRAND TOTAL	1	21	2[illegible]			5	19	26			[illegible]	19	[illegible]			--	--	--

*Punjab Flying Club

APPENDIX 15.

Fatality and accident rates in respect of Major Accidents to Indian Aircraft

	1935	1934	1933	1932
(1) Aircraft hours flown	27 325	18 413	15 240	11 550
(2) Aircraft miles flown (Approx)	2 377 574	1 624 895	1 200 000	992 000
(3) Accident involving fatalities —				
(a) Crew	5	3		1
(b) Passengers	4			1
(c) Other persons	1	1		
(4) Non fatal accidents involving serious injuries—				
(a) Crew	.	2	3	2
(b) Passengers			..	..
(c) Other persons				
(5) Number killed—				
(a) Crew	6	3		1
(b) Passengers	6	.		1
(c) Other persons	2	1		.
(6) Number of seriously injured—				
(a) Crew	2	4	3	2
(b) Passengers				
(c) Other persons				-
(7) Miles flown per fatality	125 66[illegible]	406 [illegible]24		496 000
(8) Miles flown per serious injury or fatality	148 598	203 112	400 000	248 000

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